NIAGARA MACHINE AND TOOL WORKS

TOOLS and MACHINES for SHEET METALS

107

CATALOG No. 56

Machines and Tools for Sheet Metals

MADE BY

NIAGARA MACHINE & TOOL WORKS

ESTABLISHED 1880

PUNCHES ROLLS
TINSMITHS' TOOLS AND MACHINES
PRESSES
SQUARING AND ROTARY SHEARS
ETC.

Buffalo, N. Y., U. S. A.

Cable Address:
"STAMPING"

To Our Patrons:

This catalog is principally intended to show our standard tools and machines for general sheet metal work, and not so much those for quantity production. We have separate catalogs of Presses and Power Shears, which will be cheerfully sent to those in the market for such machines

The "NIAGARA" line of TOOLS AND MACHINES FOR SHEET METALS compared with others possesses the important advantage that it includes the largest variety, from ordinary hand tools to big Presses and Shears, etc., and we are thereby enabled to offer such equipment as is best adapted to each case, depending upon output, individual desires, etc., while avoiding unnecessarily large investment.

The following pages give some typical views of our other types of MACHINES FOR SHEET METAL WORK, and catalogs describing them will be cheerfully sent to those in the market.

Yours respectfully,

NIAGARA MACHINE & TOOL WORKS.

TERMS

Inquiries. Prompt attention is given to all inquiries. In order to save time the requirements should be fully specified, and samples or correct drawings of special work should be sent.

Illustrations given in this catalog are fair representations of the various machines and tools, but are not binding in detail. When a machine is made by us in more than one size, it occasionally happens that the different sizes vary in form and detail, or modifications may be made before revised catalogs are issued.

Weights given are approximate shipping weights to enable intending buyers to estimate the freight charges.

Capacities. In giving details of tools and machines, or their capacities, we endeavor to indicate the range of work to which we consider them adapted. Should it be proven that tools and machines furnished by us do not come up to our representations, buyers are at liberty to return them to us by freight within two weeks after arrival, and we will cancel the sale, without assuming further obligations.

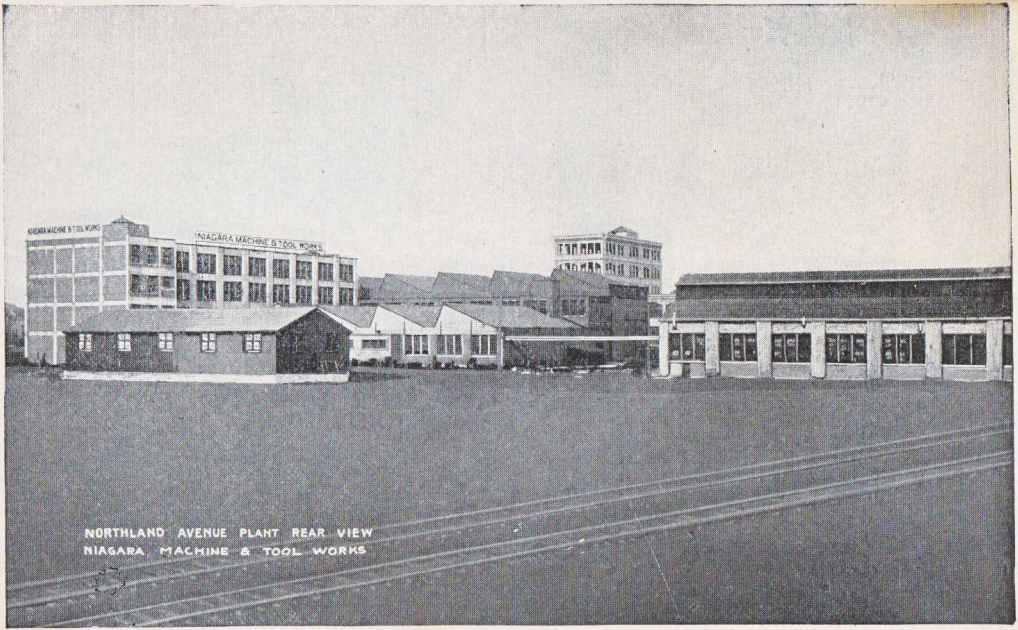
Orders are filled with all possible dispatch, but under no circumstances will we guarantee the time of delivery. When date of delivery is mentioned we will endeavor to complete the work as near the time as possible, but cannot assume the responsibility for any loss or inconvenience caused by overdue delivery or our inability to produce the work undertaken, nor can orders be canceled without our consent after the work has been commenced. Orders placed through our agents are subject to the approval of the firm.

Delivery. We deliver to railroad or express company in this city in good order and condition and are not responsible for any delays and damages occurring in transportation.

Terms of Payment. Unless otherwise agreed, terms on approved credit are net cash 30 days from date of invoice, subject to sight draft with exchange on New York.

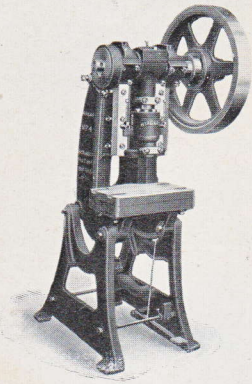
Claims must be brought to our notice within a reasonable time. We do not assume any obligations for unauthorized alterations on tools, machines and parts furnished by us.

Prices are subject to change without notice. Quotations are for tools and machines made according to our standard practice prevailing at the time of sale and for immediate acceptance. Clerical errors in our proposals are subject to correction.

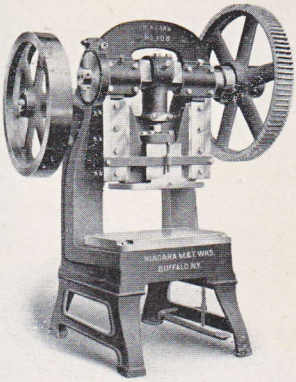


NORTHLAND AVENUE PLANT REAR VIEW
NIAGARA MACHINE & TOOL WORKS

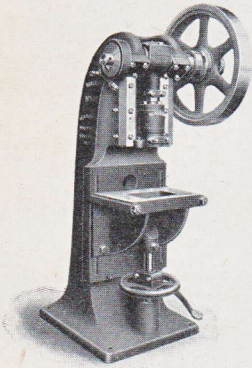
NIAGARA POWER PRESSES—TYPICAL ILLUSTRATIONS



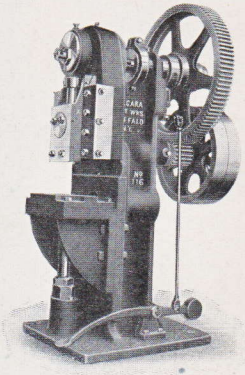
Inclinable—open back Press



Upright—open back Press

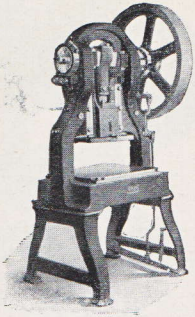


Horn and Wiring Press

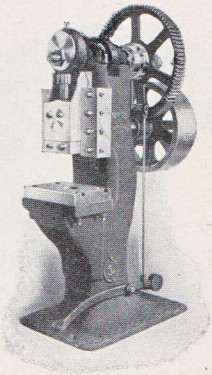


Punching Press—adjustable bed

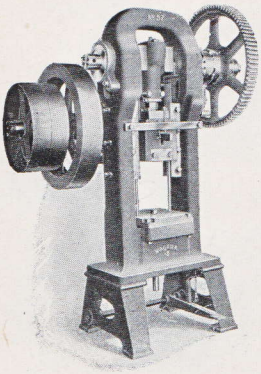
NIAGARA POWER PRESSES—TYPICAL ILLUSTRATIONS



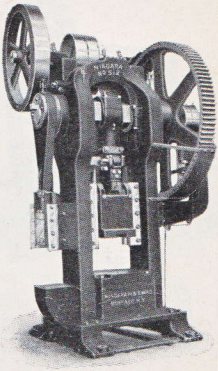
Arch Press



Punching Press

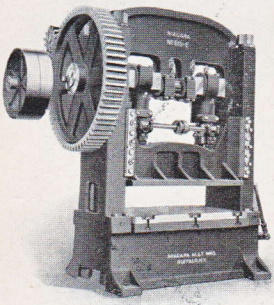


Straight-sided Press

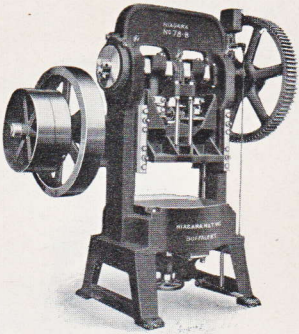


Trimming Press

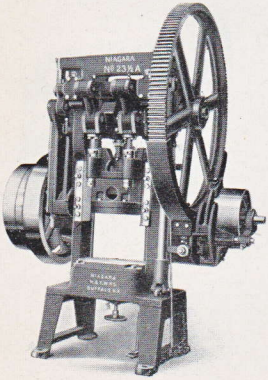
NIAGARA POWER PRESSES—TYPICAL ILLUSTRATIONS



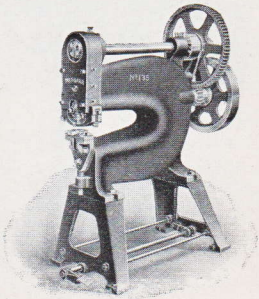
Double Crank Press



Double Crank Press

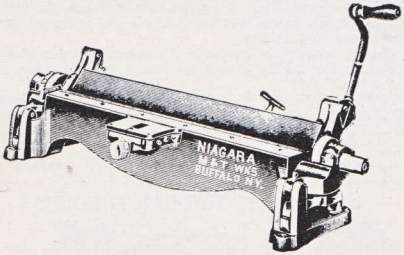


Toggle Draw Press



Power Punch

KEYSTONE ADJUSTABLE BAR FOLDER—Patented.



These Folders are among the most important machines in sheet metal shops, being extensively used for bending or folding the edges of sheets at various angles for lock seams, joints, turning flanges on straight sheets, etc., also for rounding the edges when a wire is to be inserted.

As the edge of the material is firmly clamped while the bending takes place, a fold which is of uniform width the entire length is obtained.

Gauge which regulates the width of the fold is adjusted by turning the knob on the frame extension and a scale indicates the width in fractions of inches for which adjustment is made, to avoid measuring or trying.

Adjustable Stop limits the motion of the folding bar for any desired angle and square and level stops are also provided.

Rounded Edges. The wing, which is mounted on the folding bar, can be adjusted to produce rounded edges for wire up to ¼ inch; 17 inch folder for $\frac{3}{16}$ inch wire. The top surface of the wing remains flush with the gripping jaw until the operator begins to swing the folding bar, which facilitates placing the work in position.

Capacity. No. 22 iron, if folds are $\frac{3}{16}$ inch or wider; No. 24, if folds are narrower. We adjust Bar Folders for IC and IX tin; for thicker material proper adjustment must be made.

Interchangeable Parts are used for our Bar Folders. Orders for duplicate parts should state factory number of machine for which they are intended.

Counterbalance Attachment for folding bar can be applied to 17 to 36 inch Bar Folders, at extra charge, while it is included in the prices of 42, 60 and 72 inch Folders.

60 and 72 Inch Folders. Their construction differs from that of the shorter machines, but they accomplish the same object.

17 and 21 Inch Folders have handle socket on one end only.

Keystone Bar Folders	For Locks	Code Word	Shipping Weight	Price
17 inches.....		Taalc	105 lbs.	$.....
21 inches.....	$\frac{3}{32}$ to 1 inch....	Taani	125 lbs.	.....
30 inches.....		Taaol	230 lbs.	.....
36 inches.....		Taapo	350 lbs.	.....
42 inches.....	⅛ to 1⅝ inch....	Taars	510 lbs.	.....
60 inches.....	⅛ to 2 inch....	Tabav	1,050 lbs.	.....
72 inches.....	$\frac{3}{16}$ to 2 inch....	Tabby	1,600 lbs.	.....
Counterbalance Attachment for 17 to 36 inch Bar Folders, extra.....				$ .....
Foot Treadle and Spring Attachment for 17 and 21 inch Folders, extra				.....

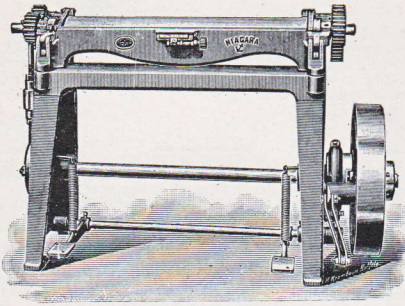
EXCELSIOR BAR FOLDERS

These folders are very useful in lithographing and printing establishments for mounting show cards, hangers, etc. They are the same as the "Keystone," page 7, except for a quick adjusting device for the thickness of material and an attachment for counterbalancing the folding bar.

Quick Adjusting Device is used to increase the space between the jaw and folding blade to make room for the tin previously folded and set down upon the inserted paper.

Excelsior Bar Folders	Code Word	Shipping Wt.	Price
21 inches	Tabde	145 lbs.	$.....
30 inches	Tabem	250 lbs.	.....

NIAGARA POWER BAR FOLDERS



Capacity No. 24 iron and lighter

Power drive is of advantage on Bar Folders when work is to be turned out in quantities, as the operator is left with his hands free to handle the material. Both ends of the folding bar are actuated by means of segments and pinions from a rocking shaft oscillated by a crank disc. Power Bar Folders possess all the advantages of our Keystone Folders, viz., adjustable gauge with index, adjustment for rounded locks, etc.

Clutch. The motion is controlled by a positive clutch. By depressing the foot treadle the folding bar is caused to make one turn and it will stop on returning to the original position, unless the operator keeps the treadle depressed.

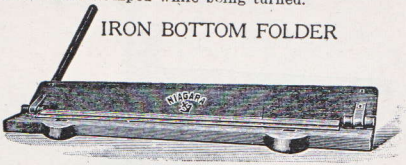
Angle of the Bend can be regulated by adjusting the connecting rods on the crank disc.

Power Bar Folders	For Locks	Code Word	Shipping Weight	Price
30 inches	3/32 to 1 inch	Tabit	1,050 lbs.	$. .....
36 inches	3/32 to 1 inch	Tabka	1,200 lbs.	.....
42 inches	1/8 to 1 5/8 inch	Taboh	1,425 lbs.	.....

Special Bar Folders can be furnished at proper charge—
For extra wide edges, which modification increases the narrowest limit.
For bevel locks, which are wider on one end than on the other.
For extra narrow edges, on light stock only.
With gauge points of hardened tool steel, etc.
Inquiries should explain the requirements.

Sheet Iron Folders described on this page are intended for ordinary work. The edge of the material is not clamped while being turned.

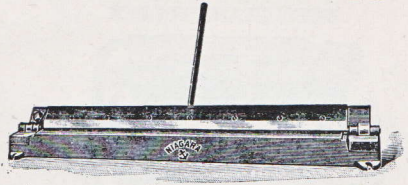
IRON BOTTOM FOLDER



Gauge is adjustable for locks from $\frac{3}{16}$ to ½ inch wide. The folding blade is on the stationary bar.

Iron Bottom Folder	Capacity	Code Word	Shipping Weight	Price
30 inches.....	No. 24	Tabus	70 lbs.	$.....

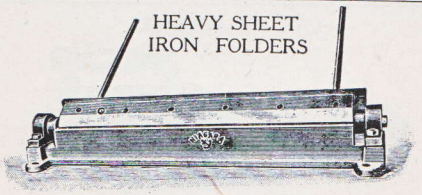
IMPROVED SHEET IRON FOLDERS



Gauge is moved parallel to the edge of the folding blade and adjustable for locks from $\frac{3}{16}$ to ⅜ inch. The folding blade is on the swinging bar.

Improved Sheet Iron Folders	Capacity	Code Word	Shipping Weight	Price
30 inches.....	No. 24	Tabwi	80 lbs.	$.....
42 inches.....	No. 24	Tabyo	120 lbs.	.....
60 inches.....	No. 26	Tacel	275 lbs.	.....

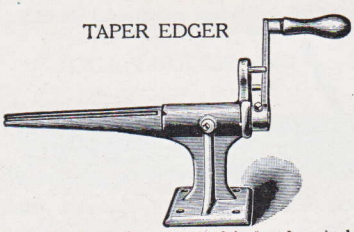
HEAVY SHEET IRON FOLDERS



These folders are substantially made and the gauge is adjustable from ¼ to 2 inches.

Heavy Sheet Iron Folders	Capacity	Code Word	Shipping Weight	Price
No. 4, 42 inches.....	No. 20	Tacgo	390 lbs.	$.....
No. 4, 48 inches.....	No. 20	Tacin	445 lbs.	.....

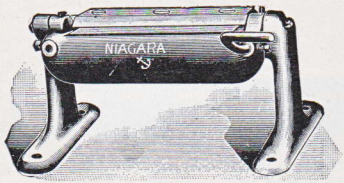
TAPER EDGER



Intended for folding the edges of small cylindrical and conical work made of light material. The work must be at least 2 inches diameter, if 6 inches long.

Taper Edger	Code Word	Net Weight	Price
6 inches.....	Tacov	9 lbs.	$.....

BODY BLANK FOLDER

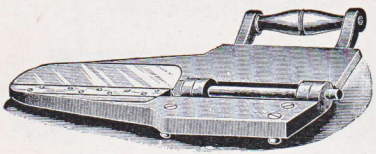


For. No. 26 iron and lighter

For folding the edges of can bodies and other cylinders not less than 2½ inches diameter, also for small flat sheets.

Body Blank Folder	For Locks	Code Word	Net Weight	Price
12 inches.....	⅛ to ¼ inch	Tacru	25 lbs.	$.....

CAN TOP FOLDERS

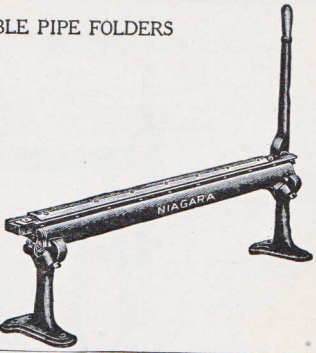


For. No. 26 iron and lighter

The open end of these Folders makes them suitable for folding taper blanks such as oil can breasts, funnels, etc. An adjustable gauge is provided.

Can Top Folders	For Locks	Code Word	Net Weight	Price
No. 2, 10 inches.....	3/32 to ¼ inch	Tacta	25 lbs.	$.....
No. 3, 13 inches.....	⅛ to ⅜ inch	Tacug	65 lbs.	.....

NIAGARA ADJUSTABLE PIPE FOLDERS

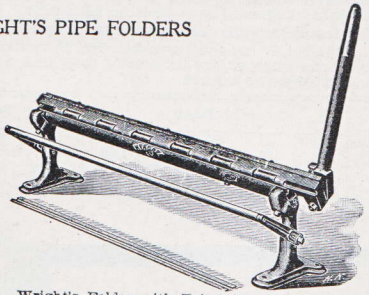


Ordinary Stove Pipe Folders cannot be relied on to fold the edges uniformly, owing to variations in the material which may be hard in some and soft in other places. With this folder locks of uniform width the entire length are obtained. Edges can be turned on sheets of any length, the same as with the Fairchild's Attachment to Wright's Folders. Steel rod is inserted to protect the edge of the lower bar.

Adjustable Gauge for locks from $\frac{1}{16}$ to $\frac{3}{8}$ inch wide is provided.

Niagara Adjustable Pipe Folders	Capacity	Code Word	Shipping Weight	Price
30 inches.....	No. 22	Tafpu	90 lbs.	$.....
42 inches.....	No. 24	Tafsa	125 lbs.	.....

WRIGHT'S PIPE FOLDERS



Wright's Folder with Fairchild's Attachment

Suitable for folding the edges of cylindrical work; also for flat sheets.

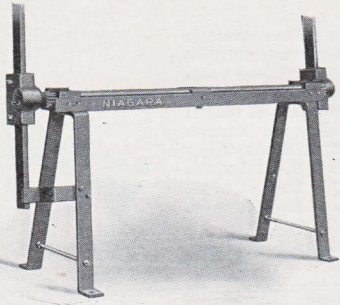
Fairchild's Attachment is used in turning the edges of sheets of any length. A slight bend is first made the entire length and the operation is repeated until the edge is turned as far as possible, not more than at right angles.

Wright's Folders are suitable for locks $\frac{3}{8}$ and $\frac{1}{16}$ inch wide.

Fairchild's Folders are suitable for locks $\frac{3}{8}$, $\frac{1}{16}$ inch, also for $\frac{1}{2}$ and $\frac{5}{8}$ inch, by using the steel strips under the blade to increase its width.

Wright's Folders	Capacity	Code Word	Shipping Weight	Price
30 inches	No. 22	Tafur	75 lbs.	$.....
62 inches	No. 24	Tagew	185 lbs.	.....
30 inches, with Fairchild's Attachment	No. 22	Tagic	80 lbs.	.....

NIAGARA PIPE FOLDERS



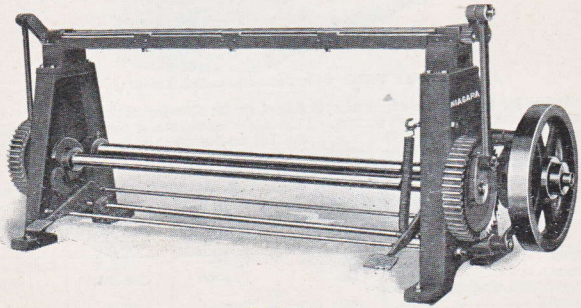
For hand

Particularly intended for folding the edges of sheet metal pipe and cylinders not less than 5 inch diameter and they are also suitable for flat sheets.

Clutch actuated by foot treadle controls the motion of the Power Pipe Folders.

Capacity: 36 to 60 inches, No. 22; 96 and 120 inches, No. 24 iron and lighter. Each machine is made for one width of lock between ¼ to ½ inch wide; ⅜ inch lock is provided for, unless otherwise ordered

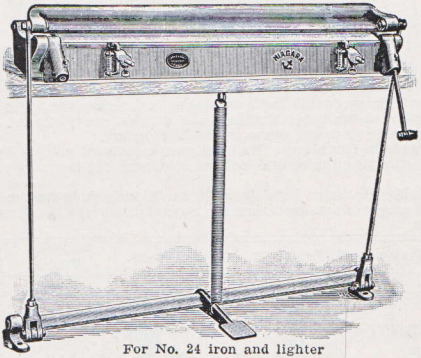
	For Hand					For Power			
Length .....inches	42	48	60	96	120	48	60	96	120
Ship. wt.....lbs.	235	275	300	600	700	750	880	1,300	1,500
Code word	Taomu	Tapab	Tapet	Tapko	Tapny	Tarer	Tarfa	Tarik	Tarlt
Price .....$	.....	.....	.....	.....	.....	.....	.....	.....	.....



For power

Open Throat Folders and Brakes. There is an unobstructed space between the bed and clamping bar when the latter is in the elevated position. The sheet can be passed through between these parts and bent any distance from its ends. The sheet remains stationary during the bending operation.

NIAGARA OPEN THROAT FOLDER



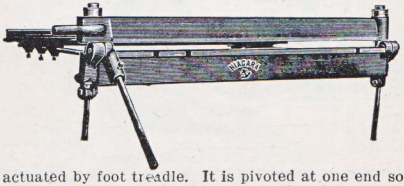
For No. 24 iron and lighter

Clamping Bar is actuated by foot treadle.

Front Gauge is adjustable for close locks from ¼ to 2 inches wide. Wider bends can be turned at an angle of not less than 40 degrees.

Niagara Open Throat Folder	Code Word	Ship. Weight	Price
36 inches	Tadba	235 lbs.	$.....

BENCH SQUARE PIPE FORMERS



Clamping Bar is actuated by foot treadle. It is pivoted at one end so that the operator can swing the bar sideways to facilitate removing the work. Slots can be cut in the clamping bar to receive flanges turned previously on the material.

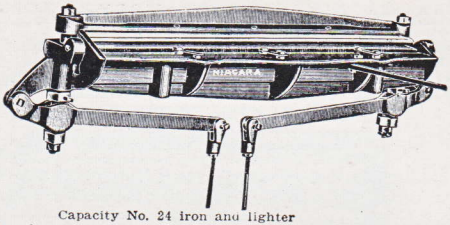
Three Gauges, adjustable on brackets, permit making the successive bends in forming square pipe without marking the sheet.

	For Pipe Not Less Than	Capacity	Code Word	Ship. Wt.	Price
36 inches....	3 x3 inches	No. 24	Tadmi	250 lbs.	$.....
24 inches....	5¾x5¾ inches	No. 20	Tadsy	560 lbs.	.....

SPECIAL FOLDERS

Besides the Folders mentioned in this catalog we have patterns which can be used in meeting unusual requirements. Inquiries should explain the nature of the work in detail, giving dimensions, shape, thickness of material, etc.

DOUBLE LOCK FOLDER



Capacity No. 24 iron and lighter

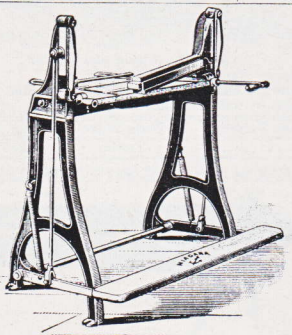
Intended for forming double locks on sheets for roofing, etc. The two bends are **turned** successively at the same handling and without readjustment. The sheet is inserted from the rear up to the gauge on the folding bar.

Folding Bar is made in two pieces. Its front part is lowered quickly by means of the handle before turning the second lock, as otherwise the inner lock would be compressed.

Gauge is adjustable for inner bend from 1/8 to 5/8 inch wide and unless otherwise ordered the gauge is arranged that the second bend will be 3/8 inch wider than the first one.

Niagara Double Lock Folder	Code Word	Shipping Weight	Price
36 inches	Taduf	215 lbs.	$.....

SQUARE BODY AND PIPE FORMERS



For No. 26 iron and lighter

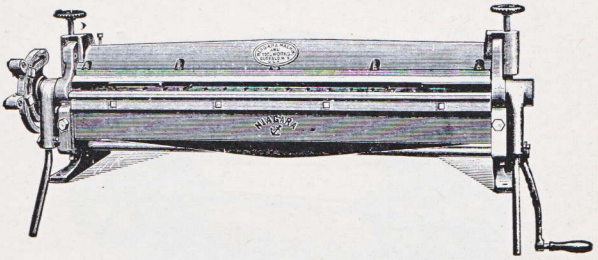
Intended for forming square and oblong pipe, can bodies, etc., with square as well as rounded corners.

Clamping Bar is actuated by foot treadle. It is fitted with removable corner forming pieces, one for square and two for round corners, 1/8 and 1/4 inch radius. The bar is hinged on one end and the other end can be released and swung outwardly to permit removing the formed work. Slots can be cut in the clamping bar to receive flanges turned previously on the material.

Three Gauges are furnished to fix the position of the sheet in making the successive bends.

Square Body and Pipe Formers	For Pipe Not Less Than	Code Word	Shipping Weight	Price
30 inches	3x3 inches	Tadzu	460 lbs.	$.....
36 inches	3½x3½ inches	Taece	500 lbs.	.....
48 inches	4x4 inches	Tafaz	600 lbs.	.....

UNIVERSAL FOLDERS AND BRAKES



For No. 20 iron and lighter

Will turn sharp edges for lock seams and round edges for wiring, the same as a Folder and sheets can also be bent any distance from the ends, as on a Brake. The material remains stationary while the folding takes place.

Clamping Bar can be adjusted from 1 to 3 inches above the bed by means of the screws above the housings and it is lowered 1 inch by a half turn of the handle on the one side, to clamp the stock.

Folding Bar is of solid steel, its upper edge being ⅜ inch wide. A removable reinforcing bar is provided which increases the width to 1 inch. The bar is adjustable up and down to permit turning rounded edges with not more than ¼ inch radius. For the best result it is advisable to use a special folding blade with an edge having the desired rounding.

Folding Blade around which the material is bent, can be readily removed to allow substituting others of different shapes.

Back Gauge is adjustable from ¼ to 10 inches and can be taken off entirely. The back gauge rods are graduated in $\frac{1}{16}$ inches.

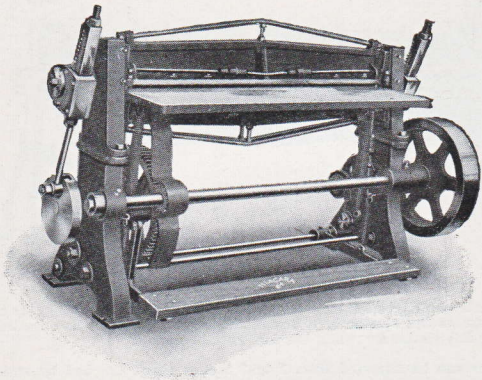
Adjustable Stops. The segment shaped extension at the one end of the Folder carries adjustable stops to regulate the angle of the bend. The stops can be instantly moved in and out of position.

Front Gauge adjustable for locks from ¼ to ¾ inch is attached to the folding bar. The reinforcing bar is then removed.

Price includes one folding blade for sharp lock and adjustable front and back gauges.

No. 1 Universal Folder and Brake	Capacity	Code Word	Shipping Weight	Price
18 inches.....	No. 18	Tagno	300 lbs.	$.....
42 inches.....	No. 20	Tagry	500 lbs.	.....
60 inches, on iron legs.....	No. 20	Tahch	1,050 lbs.	.....

NIAGARA POWER FOLDERS AND BRAKES



48-inch Power Folder and Brake, back-geared

These machines turn close or open folds for lock seams, etc. The sheet is gripped between bed and clamping bar and remains stationary while the folding takes place. The clamping bar raises about ¾ inch above the bed to permit withdrawing the folded sheet.

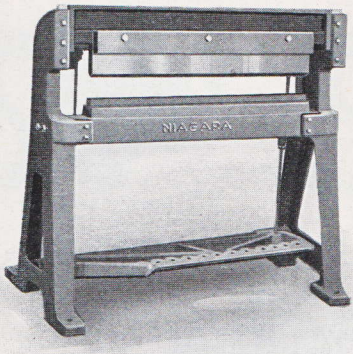
Clutch controls the motion of the clamping and folding bars. Upon depressing the foot treadle one bend is made and the bars stop in the original position, unless the treadle is kept depressed.

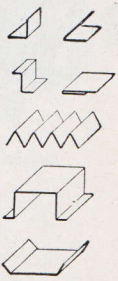
Adjustable Gauge on the folding bar for locks from $\frac{3}{16}$ to 1 inch wide. The angle of bend can be regulated to not less than 30 degrees by adjusting the stroke of the folding bar.

	36 Not Geared	36 Geared	48	72
Capacity iron.....No.	22	20	20	22
Size of flywheel.....inches	22x4	22x4	22x4	22x4
Speed of flywheel.....R. P. M.	60	225	225	215
Ratio of gearing.....	.....	4½:1	4½:1	4½:1
Shipping weight.....lbs.	1,250	1,550	1,900	2,700
Code word.....	Taeop	Taept	Taeuf	Taewl
Price .....$	.....	.....	.....	.....

Special Power Folders. These machines can be modified for special folding work, combined folding and offsetting operations, rounded locks, etc.

NIAGARA FOOT BRAKE





This machine is designed for dies or blades intended to perform straight bending operations on light sheets.

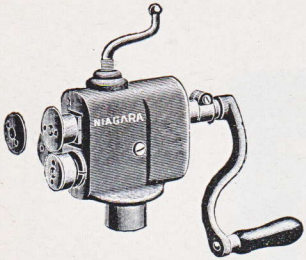
The illustration shows blades for acute angle bends. Other blades can be readily substituted. The upper blade extends 4 inches below the crosshead to make room for the formed work.

Back Gauge on brackets in the rear of the machine can be set up to 24 inches from the blades.

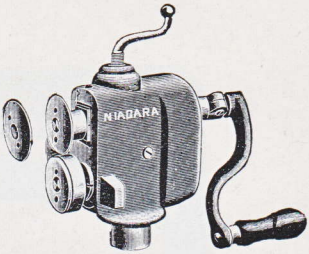
Capacity. With the acute angle blades 45-degree bends can be made on No. 22 iron and lighter.

Working length.....inches	36
Stroke of slide.....inches	2
Shipping weight.....lbs.	525
Code word.....	Taexo
Price, with acute angle blades.....$	.....

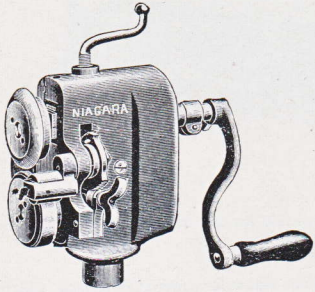
NIAGARA "SUPERIOR" MACHINES—ENCASED



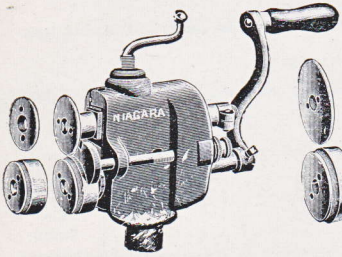
Superior Small Burr



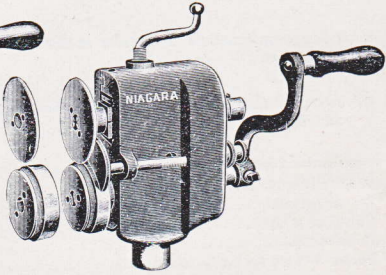
Superior Large Burr



Superior Wiring Machine



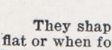
Superior Small Turner



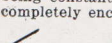
Superior Large Turner

TINSMITHS' BENCH MACHINES

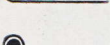
They shape the edges of light sheet metal with straight or curved outlines, while flat or when formed in cylindrical shape. They are indispensable in sheet metal shops, being constantly required for an endless variety of work. We furnish them either completely encased, Superior type, or with open frame, Buffalo type.



Turning Machines form a rounded edge ready to insert a wire.



Wiring Machine closes the edge produced with the Turning Machine over an inserted wire.



Burring Machine turns sharp, narrow edges at various angles. They are used for flanging bottoms and cylinders prior to setting down and double seaming, etc.

NIAGARA SUPERIOR MACHINES—ENCASED

They are of modern design and high grade workmanship. The frame is extra heavy

Gears are entirely enclosed in the frame.

Crank Screw that raises and lowers the upper shaft is in such position that it will not interfere with the work. It moves the upper shaft twice as quickly as that of ordinary machines. The crank screw works in a steel bushing and a spring cushion takes the strain in going over seams.

Gauge is made of extra fine tool steel.

Faces are removable from the shafts. The upper face and shaft can be adjusted laterally for the thickness of the material.

Bearings are adjustable for wear.

Interchangeable Parts are used for Superior Machines. When ordering parts state factory number of machine.

Wiring Machine—For wire up to $\frac{5}{16}$ inch diameter.

Large Turner—Thickness of upper faces $\frac{3}{32}$ and $\frac{3}{32}$ inch.

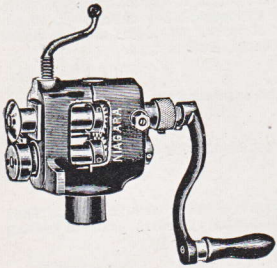
Small Turner—Thickness of upper faces $\frac{2}{64}$ and $\frac{3}{16}$ inch.

Superior Encased Machines	Between Shaft Centers	Code Word	Shipping Weight	With Standard
Wiring Machine	2⅞ inches	Tafdi	40 lbs.	$.....
Large Turner, with extra upper and lower faces	2⅞ inches	Tafes	41 lbs.	.....
Small Turner, with extra upper and lower faces	2⅛ inches	Taffo	37 lbs.	.....
Large Burr, with extra upper face	2⅛ inches	Tafke	36 lbs.	.....
Small Burr, with extra upper face	1½ inches	Tafog	30 lbs.	.....

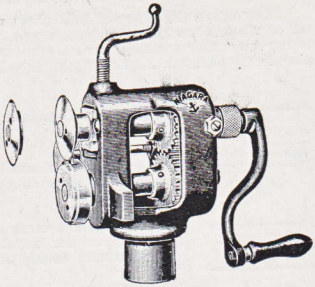
Treadle Attachment in place of crank screw, extra.

Small Superior Standard is furnished with these machines.

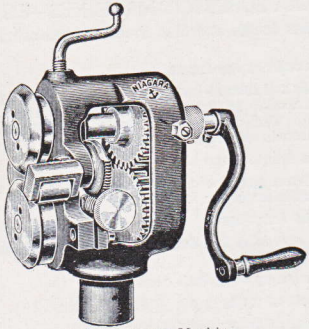
BUFFALO MACHINES



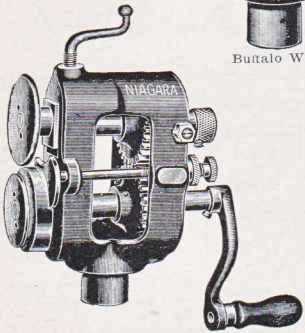
Buffalo Small Burr



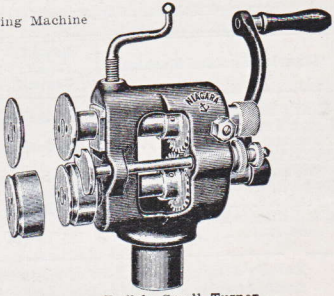
Buffalo Large Burr



Buffalo Wiring Machine



Buffalo Large Turner



Buffalo Small Turner

BUFFALO MACHINES—OPEN FRAME

They are similar to our Superior Encased Machines, page 18, the principal difference being in the frame, which is made of one piece and open. Workmanship and details conform with the Niagara standard practice.

Wiring Machine—For wire up to $\frac{5}{16}$ inch diameter.

Large Turner—Thickness of upper faces, $\frac{3}{8}$ and $\frac{3}{4}$ inch.

Small Turner—Thickness of upper faces, $\frac{3}{8}$ and $\frac{5}{16}$ inch.

Buffalo Machines	Between Shaft Centers	Code Word	Shipping Weight	With Standard
Wiring Machine	2⅛ inches	Tahgu	39 lbs.	$.....
Large Turner, with extra upper and lower faces	2⅞ inches	Tahir	40 lbs.	.....
Small Turner, with extra upper and lower faces	2⅛ inches	Tahuk	35 lbs.	.....
Extra Small Turner, with extra upper and lower faces	1½ inches	Tahwo	27 lbs.	.....
Large Burr, with extra upper face	2⅛ inches	Taifs	34 lbs.	.....
Small Burr, with extra upper face	1½ inches	Tajad	27 lbs.	.....

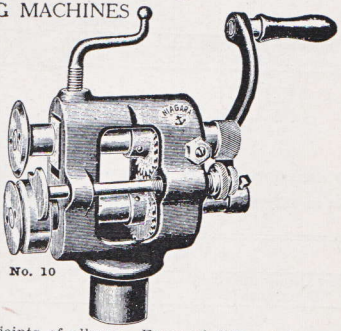
Treadle Attachment in place of crank screw, extra $.....

Small Superior Standard is furnished with these machines.

BUFFALO ELBOW EDGING MACHINES

No. 1

No. 4



No. 10

Used in making the circular joints of elbows. Faces of different types can be furnished to suit the desired kind of circular joint. They are usually applied to the Buffalo Small Turner, or can be made for other machines, particularly the Power Bench Machines, page 27.

Faces type No. 1 can be used for the outer edge of riveted or lock seamed elbows. The inner edge is turned on a burring machine. It is desirable to use a special gauge with rounded face in connection with faces No. 1.

Faces type No. 4 are used for the inside and outside edges of riveted elbows with tight or loose joint.

Faces type No. 10 (shown on the machine) produce "V" shaped creases on both elbow sections.

Faces of other design for elbow work can be furnished for our hand or power Bench Machines, to suit individual requirements.

The price of the Buffalo Elbow Edger includes one pair of any of the three kinds of faces which are shown. When ordering state number indicating type of faces wanted.

	Code Word	Shipping Weight	With Standard
Buffalo Elbow Edging Machine	Tajic	34 lbs.	$.....

Round face gauge, extra. $.....

Treadle attachment in place of crank screw, extra. .....

SUPERIOR STANDARD

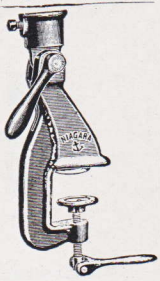
Owing to the shape of this standard, the socket is in such position that the machine is brought forward beyond the bench.

Adjustable for benches varying in thickness from 1 to 3 inches.

	Height Above Bench	Diam. of Hole	Code Word	Net Weight	Price
Small Superior Standard.....	9 inches	1⅝ in.	Tajki	11 lbs.	$.....
Large Superior Standard.....	10 inches	2⅞ in.	Tajov	21 lbs.	.....

TILTING STANDARD

By using this standard, the faces of the machine can be brought in different positions in relation to the material.



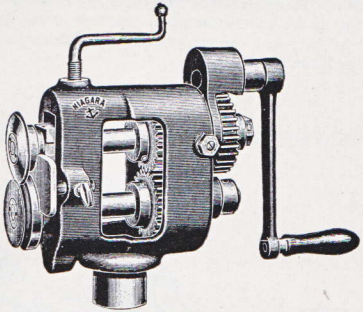
	Code Word	Net Weight	Price
Superior Tilting Standard	Tajuk	15 lbs.	$.....
Heavy Tilting Standard..	Tajxu	30 lbs.	.....

FLOOR STANDARD

Used to support machines when placed away from the work bench. Regular height 39 inches, diameter of hole 1⅝ or 2⅞ inches, as may be ordered.

	Code Word	Net Weight	Price
Floor Standard.....	Tajza	130 lbs.	$.....

HEAVY BUFFALO MACHINES—BACK GEARED



For No. 20 iron and lighter

Frame, shafts and other parts are much larger and heavier than those of ordinary Tinners' Machines. The cut shows Heavy Buffalo Turner.

Prices include one pair of faces and the large Superior Standard.

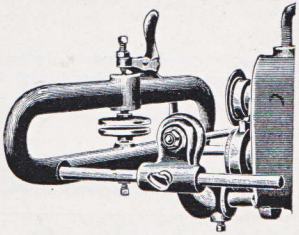
Wiring Machine—For wire up to $\frac{1}{8}$ inch diameter.

Turning Machine—Thickness of upper face $\frac{1}{16}$ inch.

	Diameter of Faces	Code Word	Shipping Weight	With Standard
Heavy Buffalo Wiring Machine....	3 inches	Tajep	97 lbs.	$.....
Heavy Buffalo Turning Machine...	3 inches	Tajmo	95 lbs.	.....
Heavy Buffalo Burring Machine....	2¾ inches	Tajse	95 lbs.	.....

No. 1 Circular Attachment to Heavy Buffalo Burr, from 4 to 20 in. diam., extra $.....

No. 2 Circular Attachment to Heavy Buffalo Burr, from 4 to 30 in. diam., extra $.....

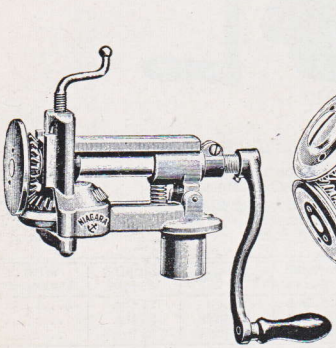


Circular Attachment shown in this illustration, if applied to a Heavy Burring Machine facilitates burring or flanging the edges of round discs. The sheet is clamped between two discs. The attachment is made to swivel to permit changing the position of the material in relation to the working faces as the burring operation proceeds.

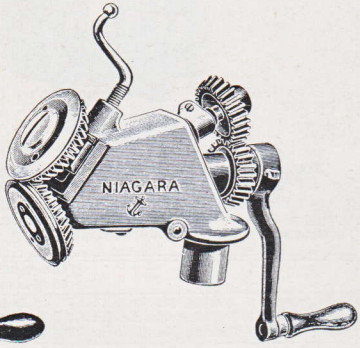
Elbow Edging Rolls, similar to those, page 21, can be applied to these machines.

Setting Down Machines. These machines turn down and compress the flange of the bottom on to the flange at the end of the body, thereby forming a joint which can be doubled over afterwards with a Double Seaming Machine.

TINNERS' SETTING DOWN MACHINES



Niagara



Superior

For No. 24 iron and lighter

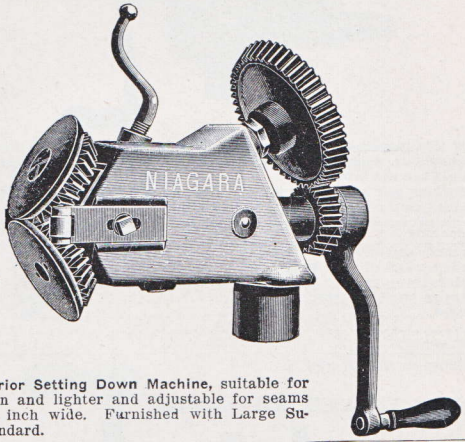
"Superior." Owing to the inclined faces, this machine possesses the advantage that the operator can bend the seam or joint slightly beyond right angles to facilitate double seaming.

	For Seams	Code Word	Shipping Weight	With Standard
Superior Setting Down Machine....	1/8 to 3/16 in.	Taken	35 lbs.	$.....
Niagara Setting Down Machine....	3/32 to 1/8 in.	Takfu	28 lbs.	.....
Niagara Setting Down Machine, extra heavy.....	3/16 to 1/4 in.	Takha	29 lbs.	.....

Small Superior Standard is furnished with these machines.

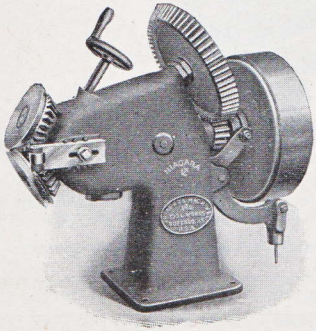
HEAVY SETTING DOWN MACHINES

These machines are of substantial design and back geared. The faces are inclined towards one another, which enables the operator to bend the seam slightly beyond right angles to facilitate double seaming. There is a guide roll on each side, adjustable for various diameters.



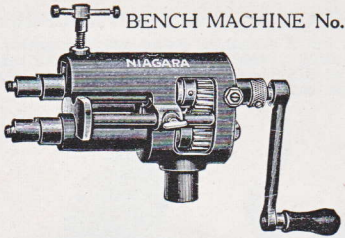
Heavy Superior Setting Down Machine, suitable for No. 20 iron and lighter and adjustable for seams ⅛ and ⅜ inch wide. Furnished with Large Superior Standard.

	Code Word	Shipping Wt.	Price
Heavy Superior Setting Down Machine..	Takim	90 lbs.	$.....
Power Setting Down Machine.....	Takow	220 lbs.	.....



Power Setting Down Machine with clutch and pulley, suitable for No. 18 iron and lighter, adjustable for seams ¼ to ½ inch wide. It has a base that is screwed to the work bench.

BENCH MACHINE No. 16



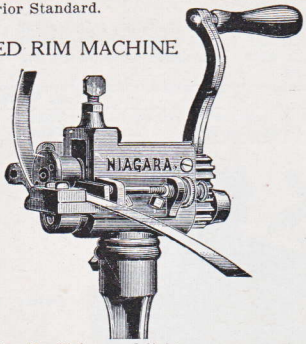
We show this machine without working rolls, because it can be furnished for a variety of operations, such as beading, flanging, turning, etc., for which the regular Bench Machines are not arranged.

When working parts are desired, inquiries should give full particulars of the work to be taken care of, thickness of material, etc.

Bench Machine	Number	16
Throat from inner end of rolls to frame	inches	4¾
Throat from inner end of rolls to gauge	inches	4½
For rolls in length up to	inches	1½
Distance between shaft centers	inches	1⅞
Shipping weight	lbs.	40
Code word		Toads
Price without rolls		$.....

Price includes Small Superior Standard.

NIAGARA ENCASED RIM MACHINE



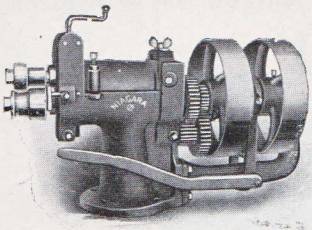
For No. 26 iron and lighter

For making rims for covers of tinware easily and uniformly. The one edge of a strip of material is flanged, the other edge drawn in and the rim is curved, all at the same time.

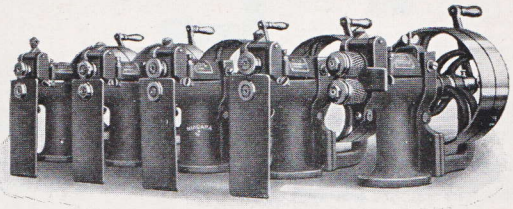
Adjustable for rims from ⅜ to 1¼ inch wide, 2 inches diameter and larger, with flange not more than ⅛ inch wide.

	Code Word	Shipping Weight	With Standard
Niagara Rim Machine.....	Talnu	40 lbs.	$.....

NIAGARA POWER BENCH MACHINES



No. 8, with Reversing Clutch and Pulley



No. 7, arranged for various operations

When burring, turning, wiring and similar operations are to be performed in manufacturing establishments on a larger scale, it is desirable to use machines better adapted to continuous power drive than the ordinary kind intended for tinsmiths' use.

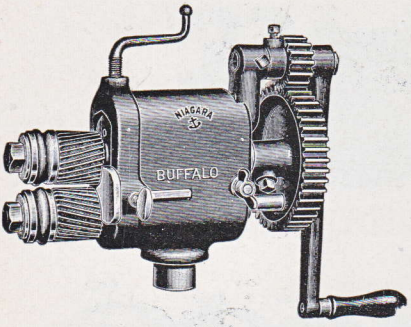
Construction. Substantial frames, long bronze-bushed bearings and extra heavy shafts. The upper shaft can be laterally adjusted. The driving shaft is supported at the outer end beyond the pulleys. Crank screw is applied for raising and lowering the upper shaft, or a treadle attachment can be furnished.

Working Parts. These machines can be arranged for a large variety of work and the working rolls and gauges are made in each case to suit the requirements which should be fully explained.

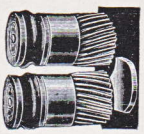
Drive. The machines are regularly equipped with T and L Pulleys, or clutch can be furnished.

Power Bench Machines No.	6	7	8
Shaft diameter.....inches	⅞	1¼	1½
Made for rolls in length up to.....inches	1	2¾	2⅞
Distance between shaft centers.....inches	1½	2⅛	2¼
Size of T. & L. pulleys.....inches	12x2½	12x2½	12x2½
Ratio of gearing.....	.....	.....	2:1
Shipping weight.....lbs.	115	150	200
Code word	Takul	Takvo	Talaf
Price without faces and gauges.....$	.....	.....	.....
Clutch and pulley extra.			$.....
Treadle Attachment in place of crank screw, extra.			.....

BUFFALO CRIMPER AND BEADER—TWO SPEEDS



For No. 20 iron and lighter



Rolls No. 15

In order to facilitate joining lengths of sheet metal pipe this machine contracts the end of the pipe by crimping it. A bead can be made at the same time to stiffen the material and to form a stop for the adjoining lengths.

Two Speeds. For light material the machine is operated rapidly by putting the crank handle on the lower shaft; for heavier material the work is made easier by driving from the back gear shaft.

Adjustment. The relative depth of the crimp and bead can be regulated quickly and with ease. A distinct crimp and shallow bead can be obtained, or vice versa, or crimp and bead can be made uniform. The adjustment is made by means of two wing nuts. By loosening one and tightening the other, the upper shaft is tipped either towards the front or towards the handle end, as may be desired.

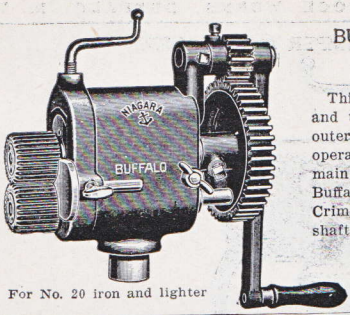
Rolls. Length of crimping rolls, 1¾ inches; length of beading rolls, 1 inch; size of O. G. $\frac{5}{8}$ inch; distance between shaft centers $1\frac{13}{16}$ inches. Rolls are made of steel and hardened. The spiral crimping rolls shown in the illustration are regularly furnished, but straight crimping rolls can be substituted, if desired.
A pair of plain collars is furnished to take the place of the beading rolls when crimping alone is to be done. Collars to replace the crimping rolls are charged for extra, if wanted.

Gears. The connecting gears are machine-cut of steel.

Rolls No. 15—The set consisting of O. G. Rolls, blank collars 1 inch long and crimping rolls 1¼ inches long can be used on the shafts of our regular Buffalo Crimper and Beader, when extra long joint is desired.

	Code Word	Shipping Weight	With Standard
Buffalo Crimper and Beader	Talbi	65 lbs.	$.....
Treadle Attachment in place of crank screw, extra.			$.....
Plain Collars to take place of crimping rolls, per pair, extra.			.....
Rolls No. 15—Per set of 3 pairs, extra.			.....

Price includes a Superior Standard.



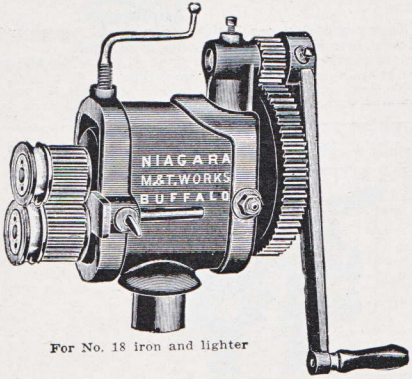
For No. 20 iron and lighter

BUFFALO CORNICE MAKER'S CRIMPER

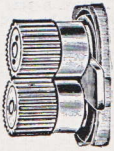
This machine carries crimping rolls only and the shafts do not extend beyond the outer end of the rolls, which enables the operator to crimp close up to a bend. The main details are similar to those of our Buffalo Crimper and Beader. Length of Crimping Rolls 1¾ inches, distance between shaft centers, 1⅛ inches.

	Code Word	Shipping Wt.	With Standard
Buffalo Cornice Maker's Crimper.....	Taldo	57 lbs.	$.....

HEAVY CRIMPER AND BEADER—GEARED



For No. 18 iron and lighter

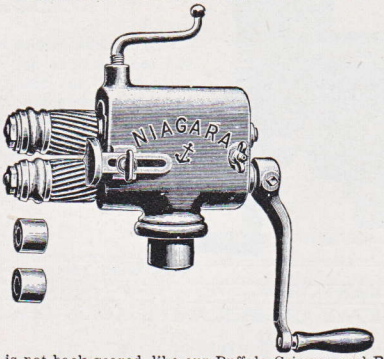


This is a very substantial machine, specially designed for heavy duty. It is for the same purpose as the lighter Buffalo Crimper and Beader, and has the same means of adjustment for regulating the relative depth of the crimp and bead.

Rolls. The rolls are secured to the shafts by countersunk nuts, leaving the outer ends of the rolls flush, that the machine can be used for crimping close to the bend, like a Cornice Maker's Crimper. Length of crimping rolls, 1¾ inches; length of beading rolls, 1¼ inches; size of O. G., ⅞ inch; distance between shaft centers, 2⅝ inches. Straight crimping rolls are furnished, also a pair of collars to take the place of the beading rolls when crimping alone is to be done. Collars to replace the crimping rolls are charged for extra, if wanted. Gears are machine cut, of steel.

	Code Word	Shipping Wt.	With Standard
Heavy Crimper and Beader, geared...	Talex	140 lbs.	$.....
Plain Collars to take place of Crimping Rolls, per pair, extra.			$.....
If with T. & L. pulleys, extra.			.....

NIAGARA CRIMPER AND BEADER



This machine is not back geared, like our Buffalo Crimper and Beader, and sometimes desired when light work is to be crimped as rapidly as possible.

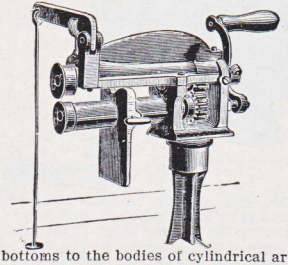
Adjustment can be made to regulate the relative depth of the crimp and bead.

We furnish a pair of crimping rolls 1¾ inches long, rolls for ⅝ inch O. G. and plain collars to be used in crimping only. Distance between shaft centers 1½ inches.

	Code Word	Shipping Wt.	Price
Niagara Crimper and Beader.....	Taoev	38 lbs.	$.....

Price includes a Superior Standard.

NIAGARA BOTTOM CRIMPING MACHINE



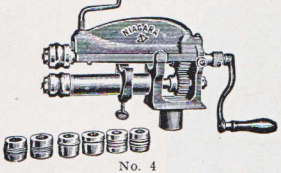
For attaching plain bottoms to the bodies of cylindrical articles made of light tin, by crimping the joint. The bottom is flanged previously. The top shaft is actuated by treadle attachment. Price includes Superior Standard.

Niagara Bottom Crimping Machine	No. 1
Diameter of work not less than.....inches	2½
Length of work not more than.....inches	7
Shipping weight .....lbs.	40
Code word	Talgy
Price .....$	.....

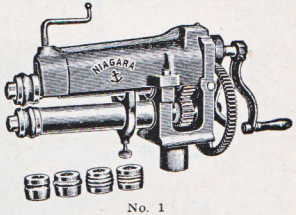
NIAGARA BEADING MACHINES

Intended for ornamenting and stiffening tinware and other sheet metal goods by forming beads corresponding with the shape of the rolls.

Nos. 1 to 5 are the Beading Machines ordinarily called for. Nos. 1 and 3 are geared. Interchangeable parts are used. Orders for repairs should state factory number of machine.



No. 4

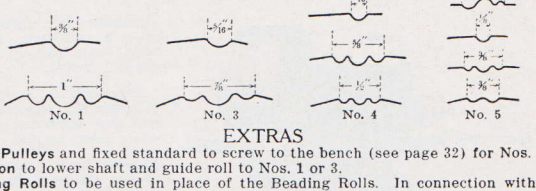


No. 1

Niagara Beaders Number	1	3	4	5
Capacity with regular rolls.....No.	20	20	26	tin
Depth of throat.....inches	13	7½	6	4
Length of rolls.....inches	17⅞	15⅝	1½	1
Distance bet. shaft centers...inches	2⅝	2¼	1⅞	1⅜
Pairs of rolls included in price.....	3	3	4	5
Shipping weight.....lbs.	170	100	50	35
Price with standard.....$	.....	.....	.....	.....
Code word.....	Talos	Talpa	Talum	Tameg
Crimping Rolls, per pair, extra.....$	.....	.....	.....	.....
Extension gauge, extra.....$	.....	.....	.....	.....

Price includes Superior Standard, large size for Nos. 1 and 3, small size for Nos. 4 and 5.

Regular Rolls are for beads shown below in the column above the number.



No. 1 No. 3 No. 4 No. 5

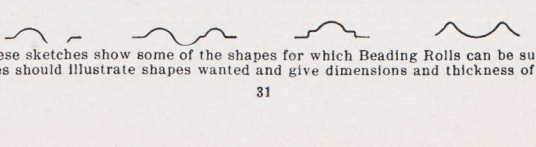
EXTRAS

T. & L. Pulleys and fixed standard to screw to the bench (see page 32) for Nos. 1 or 3.

Extension to lower shaft and guide roll to Nos. 1 or 3.

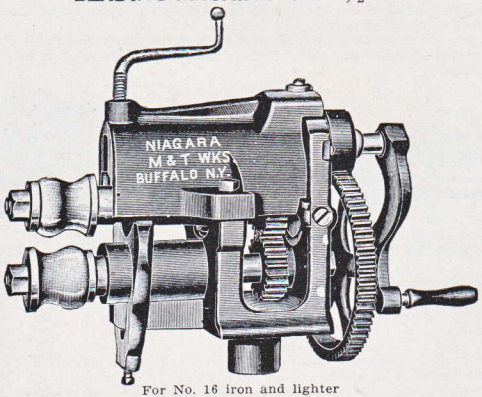
Crimping Rolls to be used in place of the Beading Rolls. In connection with these an extension gauge should be applied.

SPECIAL ROLLS



These sketches show some of the shapes for which Beading Rolls can be supplied Inquiries should illustrate shapes wanted and give dimensions and thickness of stock

BEADING MACHINE—No. 02½



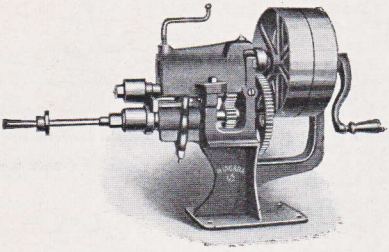
For No. 16 iron and lighter

This machine is compact and powerful.

We furnish one pair of rolls for O. G. bead 2¼ inches wide, which will answer for No. 16 iron. Length of rolls, 2⅞ inches; diameter, 2⅝ inches. Ratio of gearing, 4:1.

No. 02½ Beader	Throat	Code Word	Shipping Weight	Price
For hand, with large Superior stand.	4 inches	Tamif	150 lbs.	$.....
With T. & L. pulleys and fixed stand.	.....	Tamji	190 lbs.	.....

FLANGING MACHINE—No. 02



For No. 16 iron and lighter

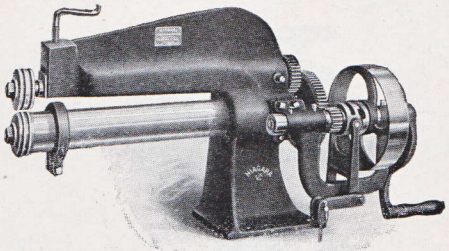
Arranged for flanging the ends of cylinders. Distance from outer end of rolls to gauge 7 inches.

Extension to lower shaft, 14 inches long, carries a guide roll and supports the work while being flanged.

Flanges from $\frac{3}{16}$ to ½ inch wide can be made. For ½-inch flange the work must not be less than 14-inch diameter, No. 16 gauge; ⅜-inch flange can be turned on No. 20. On lighter stock the height of the flange must be decreased.

No. 02 Flanging Machine	Code Word	Shipping Wt.	Price
For hand	Tamlo	150 lbs.	$.....
With T. & L. pulleys and fixed standard..	Tamoz	190 lbs.	.....
With Clutch and fixed standard.....	Tamre	.....	.....

DEEP THROAT BEADERS



No. 25, with clutch and pulley

Intended for beading a considerable distance from the edge of the material.
No. 10—½ inch single bead on No. 26. Diameter of lower roll and horn, $2\frac{7}{16}$ inches.
No. 25—½ inch single bead on No. 20. Diameter of lower roll and horn, $3\frac{7}{16}$ inches.
Price includes one pair of ½-inch single-bead rolls; length of rolls, 2½ inches.

Deep Throat Beaders	Code Word	Shipping Wt.	Price
No. 10, 20 inch	Tamuh	175 lbs.	$.....
No. 25, 28 inch	Tamwu	400 lbs.	.....

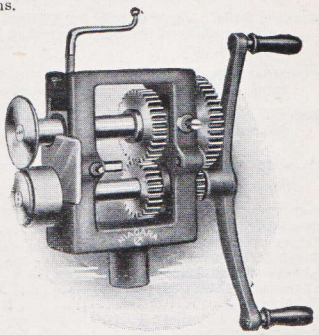
If with Clutch, extra. $.....

These machines are sometimes arranged for joining sections of round furnace pipe by beading the two telescoping sections.

No. 5 NIAGARA FLANGING MACHINE

This machine can be used for turning higher flanges than ordinary machines, provided there is no objection to well rounded corners. Extreme height of flange 1½ inches on No. 16 gauge.

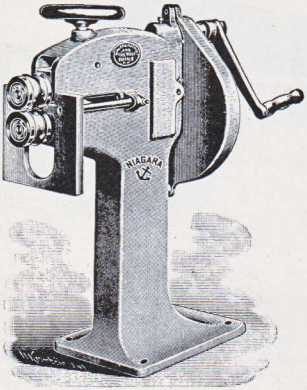
Faces are made of steel and hardened. Distance between shaft centers 3½ inches.



For No. 16 iron and lighter

	Code Word	Shipping Wt.	With Standard
No. 5 Flanging Machine	Tamya	110 lbs.	$.....

NIAGARA BEADING MACHINE—No. 0



Intended for beading, flanging and similar operations on fairly heavy material. The upper shaft has a swinging motion and is raised and lowered by hand wheel. The machine can be furnished for bench use, or for power—with pulleys or clutch.

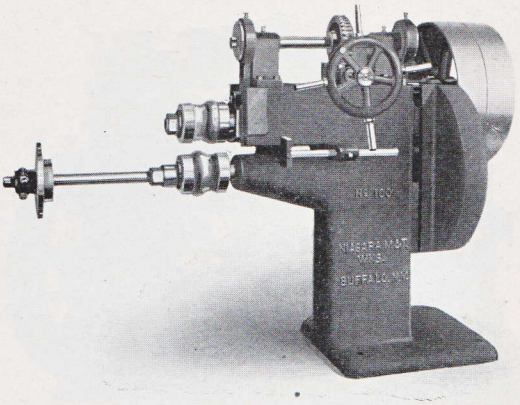
Beading Rolls. A pair of rolls for 1¾ inch O. G. bead is regularly furnished. Special rolls are charged for extra according to the requirements, which should be fully explained.

Flanging Rolls for cylinders can be furnished, the maximum height of the flanges being ⅜ inch on No. 20; ½ inch on No. 16.

Extension Support with adjustable guide roll can be added to the lower shaft, at extra charge, to carry the work while it is being operated upon.

Niagara Beading Machines No.	0	0A
Capacity with regular O. G. Rolls.....No.	14	16
Depth of throat.....inches	10½	15
Distance between shaft centers.....inches	4	4
Length of shaft ends for rolls.....inches	3	3
Diameter of shaft in bearings.....inches	1½	1½
Ratio of gearing.....	6½:1	6½:1
Size of T. & L. pulleys.....inches	16x3	16x3
Speed of pulleys.....R.P.M.	150	150
Shipping weight .....lbs.	670	750
Code word	Tanax	Tanec
Price, with T. & L. pulleys and regular rolls.....$	.....	.....

NIAGARA BEADING MACHINE No. 100-A



Designed for beading, flanging, corrugating and similar operations on heavy material in making furnace shells, sheet metal drums, steel barrels, etc.

Upper Shaft is raised and lowered parallel to the other shaft by means of eccentrics and worm gearing, which give a steady and powerful motion.

Extension Support with adjustable guide roll can be added to lower shaft, at extra charge, to carry the work while it is being operated upon.

Clutch enabling the operator to stop the motion instantly can be applied.

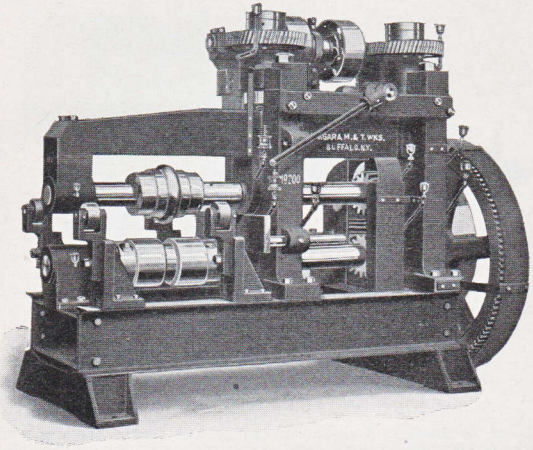
Power Attachment. A power driven attachment can be furnished for the purpose of raising and lowering the upper shaft and roll, in place of the hand device. Power feed is controlled by a double friction clutch actuated by hand lever.

Rolls are charged for extra, according to the requirements, which should be fully explained.

Flanging Rolls for cylinders can be furnished, the maximum height of the flanges being ⅜ inch on No. 20, ½ inch on No. 16, ⅝ inch on No. 14, ¾ inch on No. 10.

Niagara Beading Machine	Number	100-A
Capacity, with regular O. G. rolls	No.	12
Depth of throat	inches	15
Distance between shaft centers	inches	6
Length of shaft ends for rolls	inches	7
Diameter of shafts in bearings	inches	2½
Ratio of gearing		7:1
Size of T. & L. pulleys	inches	24x5
Speed of pulleys	R. P. M.	150
Shipping weight	lbs.	1,900
Code word		Tanga
Price, without rolls	$	.....

NIAGARA BEADING MACHINE—No. 200



This is a very substantial and powerful machine intended for beading, corrugating and flanging operations on steel barrels and similar work made of extra heavy material.

Upper Shaft is raised and lowered parallel to the lower one by means of power-driven screw, the motion of which is controlled by a reversible friction clutch actuated by hand lever.

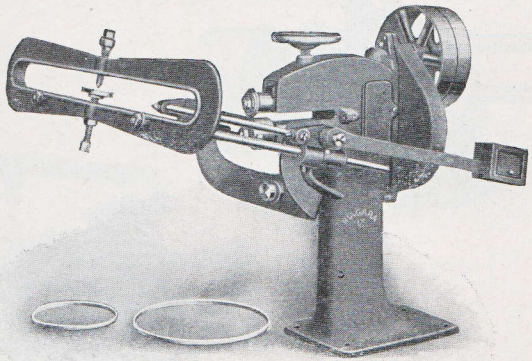
Adjustable Supports are provided on which the cylinder rests while being operated upon.

Gears are machine cut and provided with suitable guards.

Rolls are made in each case, at extra charge, to suit the requirements which should be fully explained.

Niagara Beading Machine	Number	200
Distance from frame to outer bearing of upper shaft	inches	26
Distance between shaft centers	inches	8
Diameter of shafts in bearings	inches	4
Ratio of gearing		8:1
Size of T. & L. pulleys	inches	32x6
Speed of T. & L. pulleys	R. P. M.	150
Shipping weight	lbs.	6,700
Code word		Tanis
Price, without rolls	$	

NIAGARA BOTTOM FLANGING MACHINES



No. 0

Intended for turning fairly high flanges on round discs. The material is centered and held in the yoke, which is carried on a swivel arm. The yoke is gradually raised as the flanging proceeds.

With the flanging attachment removed and the proper rolls substituted, the machines can be used for beading operations, flanging cylinders, etc.

No. 0 will flange bottoms of No. 12 to 18 iron, from 10 to 48 inches diameter. On No. 12 to 16 gauge the flange can be up to 1 inch high; Nos. 18 and 20, ¾ inch; No. 22, ⅝ inch; Nos. 24 and 26, ½ inch.

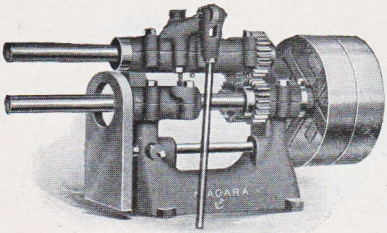
No. 100 is made off the patterns of our No. 100-A Beader. Will flange bottoms of Nos. 10 to 18 gauge from 14 to 60 inches diameter; on No. 10 gauge, a 1½-inch flange can be obtained, and on lighter stock the limitations are the same as on No. 0.

Rolls are fitted for the heaviest material for which the machine is suitable. For lighter material commencing with No. 18 extra rolls should be used if sharp corners are expected.

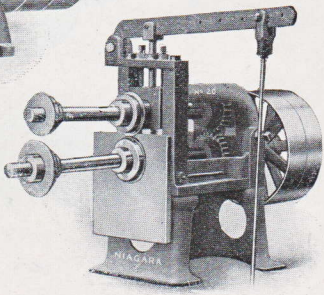
Drive. These machines can be furnished with T. & L. pulleys, or with clutch.

Bottom Flanging Machines	Code Word	Shipping Weight	Price
No. 0	Tanok	1,200 lbs.	$ .....
No. 100	Tansh	2,400 lbs.	.....

POWER FLANGING AND BEADING MACHINES



No. 20-A



No. 20

Intended for a variety of work in manufacturing establishments, such as crimping on the bottoms of cans, beading, flanging preparatory to double seaming, etc. Two or more of these operations can sometimes be performed simultaneously.

Nos. 10-A and 20-A. The upper shaft swings parallel to the lower one.

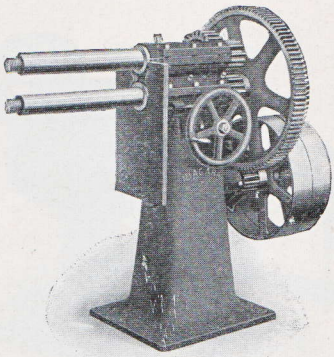
Nos. 10 and 20. The upper shaft is pivoted at the gear end. These machines are preferable for taper articles.

Inclinable Apron can be set at various angles, according to the taper of the work. Guide Rolls on the apron are charged for extra, if desired.

Working Parts are furnished to suit the nature of the work and charged for accordingly. Inquiries should give full particulars.

Flanging & Beading Mach. Nos.	10-A	20-A	10	20
For work in length up to.....inches	10	15	12	18
Distance bet. shaft centers...inches	2	4	2½	4
Diameter of shafts.....inches	1	1½	1⅛	1½
Size of T. & L. pulleys.....inches	8x2½	12x3	8x2½	10x3
Speed of pulleys.....R. P. M.	200	175	200	175
Shipping weight.....lbs.	135	325	135	350
Price, with fixed apron gauge, no rolls	$.....	.....	.....	.....
Code word.....	Tanut	Tahze	Taoco	Taofy
Inclinable apron, extra.....	$.....	.....	.....	.....

NIAGARA BEADING AND FLANGING MACHINE, No. 30



This machine can be arranged for beading, flanging, corrugating and similar operations on fairly heavy sheet metal.

Upper Roll Shaft is mounted in a swinging frame and it is raised and lowered parallel to the lower shaft by means of hand wheel and screw. For light material a treadle attachment can be applied, at extra charge.

Extension to the lower roll shaft is sometimes furnished to support cylindrical work while being operated upon.

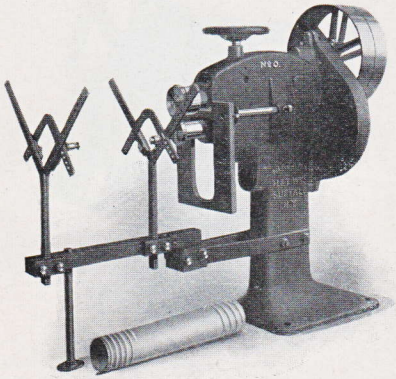
Clutch or pulleys can be furnished to drive the machine and for light work the back gears may be omitted.

Capacity. The thickness of heaviest material for which the machine will answer depends upon the nature of the work.

Rolls and Gauges are charged for extra, according to the requirements, which should be fully explained.

Beading and Flanging Machine — Number	30
Standard length of shafts beyond frame.....inches	24
Diameter of shafts in bearings.....inches	2⅞
Standard distance between shaft centers.....inches	5¼
Usual length of rolls.....inches	3½
Ratio of gearing.....	7:1
Size of T. and L. pulleys.....inches	24x5
Speed of pulleys.....R. P. M.	150
Shipping weight .....lbs.	1,125
Code word	Tache
Price, with T & L. pulleys; no rolls or gauges.....$	.....

NIAGARA PIPE THREADING MACHINES



No. 0

Intended for threading the ends of lap seamed sheet metal pipe to facilitate joining the sections.

Threading Rolls. One pair will answer for different diameters of pipe, providing the size and shape of the thread remains the same. The pitch of the thread can be varied. Separate rolls for the inner and outer ends were found desirable in some cases.

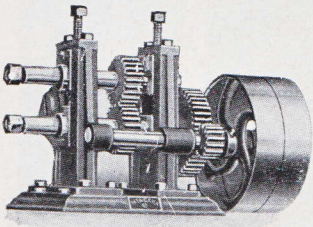
Support is provided (now differing somewhat from above illustration) for holding pipe up to 36 inches long in the proper position during the threading operation that the desired lead of the thread is obtained. No. 02 Threading Attachment is carried on a special standard for bench use. The standard also supports the machine.

Clutch controls the motion that the operator can start and stop quickly.

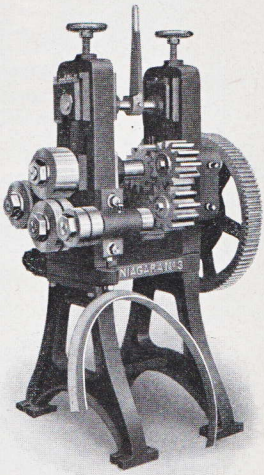
Inquiries should state the desired size and length of thread, thickness of material, smallest and largest diameters, pitch of thread, etc.

Pipe Threading Machines — Number	02	0
Throat from center of groove on rolls.....inches	6	10½
Will answer for iron inclusive.....No.	20	16
Diameter of rolls.....inches	2⅝	4
Length of rolls..... inches	2⅞	3
Smallest diameter of pipe.....inches	3	4
Regular support for pipe diameters.....inches	3 to 12	4 to 12
Shipping weight.....lbs.	200	875
Code word.....	Tarnz	Tarod
Price with 1 pair of threading rolls.....$	.....	.....

NIAGARA FORMING AND CURVING MACHINES



No. 1



No. 3 arranged for angle iron

These machines can be arranged for forming and curving operations on strips of sheet metal, for curving bars, etc. They are of substantial construction and the working parts are close to the housings to insure rigidity. They are regularly made with 3 roll shafts, but in some cases a forming shoe may be substituted for the rear shaft, which carries the curving roll.

Nos. 1 and 2 have a hand wheel for raising and lowering the upper roll. No. 1 is usually made for bench use.

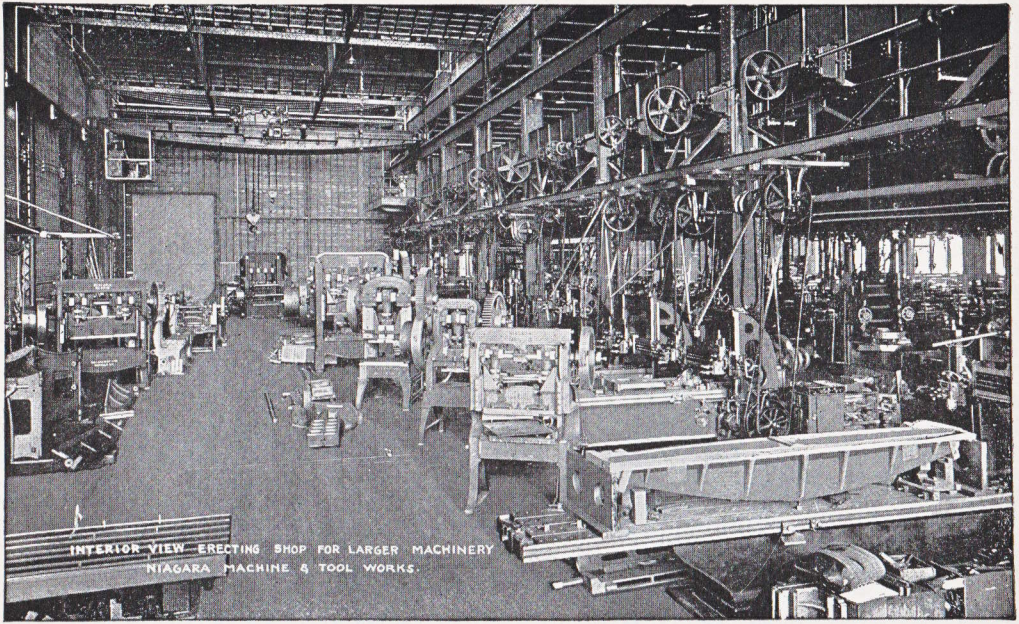
No. 3 has a toggle device, actuated by hand lever, for the upper roll. Adjustment is made by hand wheel.

Drive. We furnish T. & L. pulleys, unless clutch is ordered, at extra charge.

Rolls, Gauges and other attachments are made according to the nature of the work, which should be fully explained.

Forming Angle Bars. No. 3 can be equipped with rolls for curving angle bars up to 1¾x1¾x$\frac{3}{16}$ inch into ring shape. For the best result, two angle bars with the flange outwards must be formed at the same time. At a second operation the bars can be curved with the flange towards the inside.

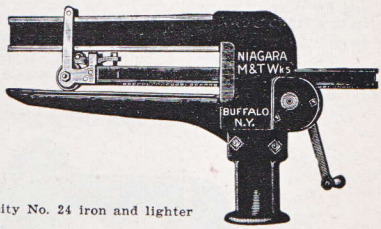
Forming and Curving Machines Numbers	1	2	3
Distance between shaft centers, standard..inches	3½	4	7
Diameter of shafts.....inches	1¾	2	3
Size of T. & L. pulleys.....inches	12x2½	18x4	20x4
Ratio of gearing.....	3½:1	6:1	15:1
Shipping weight.....lbs.	350	850	1,700
Code word.....	Tarpf	Tarri	Tarsl
Price, with T. & L. pulleys, no rolls or gauges...$	.....	.....	.....



INTERIOR VIEW ERECTING SHOP FOR LARGER MACHINERY
NIAGARA MACHINE & TOOL WORKS.

Grooving Machines are used to compress and offset the longitudinal lock seams of sheet metal cylinders on which the edges were folded previously.

BUFFALO GROOVER

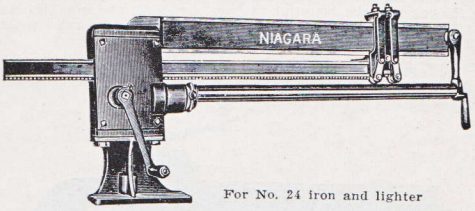


Capacity No. 24 iron and lighter

This machine is of neat design and stronger than the ordinary tinners' Groovers. **Anti-Friction Roller** running in an oil bath takes the upward pressure. **Price** includes 3 grooved rolls, $\frac{5}{32}$, $\frac{7}{16}$ and $\frac{1}{4}$ inch.

	Code Word	Shipping Wt.	Price
20-inch Buffalo Groover.....	Tarzh	110 lbs.	$.....

No. 2 NIAGARA GROOVERS



For No. 24 iron and lighter

Arranged for grooving and flattening lock seams. The grooving roll on the bar is in action on the way forward and the flattening roll on the return trip, the change taking place automatically.

Round Horn is reversible and of such size that work 2 inches diameter and larger can be grooved. The horn carries an adjustable stop.

Seam can be pressed either towards the inside or the outside of the work. Inside seam is obtained by using the flat rolls and forcing the material into one of the grooves of the horn. The grooved rolls are used for outside seams.

Rolls. Price includes two flat and three grooved rolls, $\frac{5}{32}$, $\frac{1}{4}$ and $\frac{1}{2}$ inch wide. Widths of grooves in horn $\frac{5}{32}$, $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ inch.

Special Groovers can be made for square pipe with seam in the corner, for work of smaller diameters, etc. Inquiries should state the length and diameter of work, thickness of material, width and location of seam, etc.

No. 2 Niagara Groovers	Code Word	Shipping Wt.	With Standard
20 inches.....	Tarto	170 lbs.	$.....
30 inches.....	Tarwy	190 lbs.	.....
36 inches.....	Tarye	210 lbs.	.....

If used for grooving only, the working length is 2 inches more.

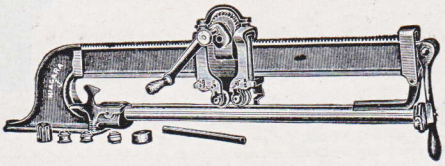
QUEEN CITY GROOVERS

These machines are suitable for grooving and flattening inside and outside seams and for work of as small size as the diameter of the horn allows. Their principal feature is the movable carriage for the working rolls.

Stops. A clamp holds the work and stops are provided to fix the position of the work. The lateral position of the folded edge is determined by a stop on the carriage.

Adjustment can be made for various thicknesses of material and for the tightness of the seam. The upward pressure is taken up by anti-friction rolls.

No. 1-30 Inch QUEEN CITY GROOVER

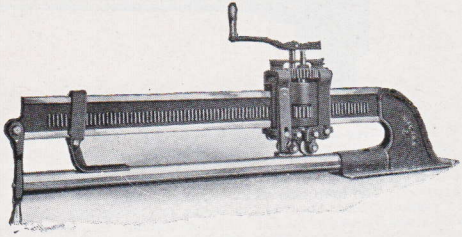


Capacity—No. 24 iron and lighter.

Rolls. Price includes four grooved rolls, $\frac{3}{16}$, $\frac{5}{16}$, $\frac{7}{16}$ and $\frac{9}{16}$ inch, and two flattening rolls. The round horn has grooves of the same widths as the grooves in the rolls.

Speed. The gears on the grooving carriage provide for two speeds, used according to the thickness of the material, and on very light material the carriage can be quickly pushed over the work by means of a rod. The crank handle can be used on either side of the frame.

HEAVY QUEEN CITY GROOVERS Nos. 3 and 4



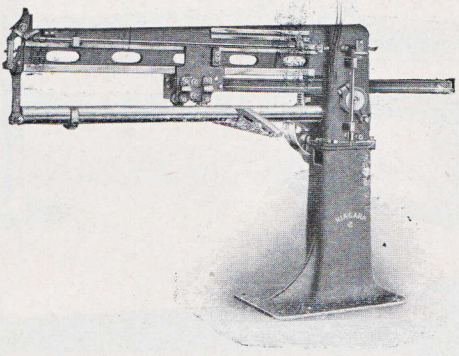
Capacity—No. 20 iron and lighter.

Rolls. Price includes three grooved rolls, $\frac{5}{16}$, $\frac{7}{16}$ and $\frac{9}{16}$ inch, and two flattening rolls. The round horn has grooves of the same widths as the grooves in the rolls.

Speed. Can be operated either direct or back geared, and with long or short leverage of the crank handle, according to the thickness of the material. Nos. 3 and 4 are back geared.

Queen City Groover	Will Groove Only	Diameter of Horn	Code Word	Shipping Weight	Price
No 1, 30 inches.....	32 inches	1⅞ inches	Tasak	160 lbs.	$.....
No. 3, 36 inches.....	38½ inches	2¾ inches	Tasbo	370 lbs.	.....
No. 4, 48 inches.....	50½ inches	3¼ inches	Tasey	450 lbs.	.....

NIAGARA POWER GROOVERS



No. 2

Intended for grooving the longitudinal seams of pipe and other sheet metal cylinders.

Grooving and Flattening. The seam is grooved as well as flattened. A grooved roll is in action on the way forward and a flattening roll on the return trip, the change taking place automatically. This method divides the strain on the machine. The rolls can be adjusted according to the thickness of the material.

Inside and Outside Seams. The reversible round horn has a flat surface besides several grooves. Inside seams are obtained by having flat rolls press the hooks into one of the grooves. For outside seams the flat surface of the horn is turned upwards and one of the grooved rolls is used on the carriage.

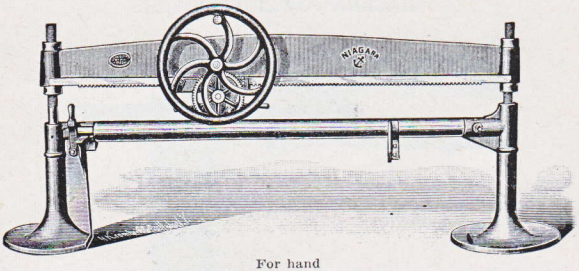
Diameter of Work. The smallest diameter of work is limited by that of the grooving horn, which is made as small as the maximum capacity of the machine permits.

Method of Operating. Two adjustable stops are provided to fix the position of the work and a guide on the carriage determines the lateral position of the folded edges. By closing the end latch the traveling carriage is started. It reverses automatically at the proper point and then returns to its original position. The carriage can be stopped at any point by means of a hand lever.

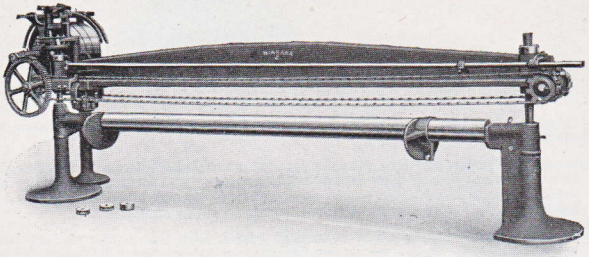
Rolls. Price includes three grooved rolls, $\frac{5}{16}$, $\frac{7}{16}$ and $\frac{9}{16}$ inch, and two flattening rolls. Grooves of the same widths are planed into the horn. The width of the seam must depend upon the thickness of the material.

Niagara Power Groovers — Number	2	2-A
Will groove and flatten....inches	36	36
Capacity iron up to....No.	20	18
Diameter of horn....inches	2¾	3½
Shipping weight....lbs.	1,275	1,360
Code word	Tasge	Tasil
Price....$	.....	.....

NIAGARA GIANT GROOVERS



For hand



For power

Capacity No. 20 iron and lighter

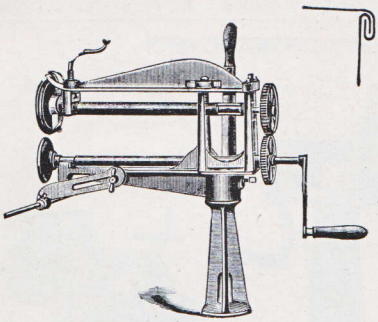
Intended for grooving the longitudinal seams of long cylinders. It is advisable to arrange them for power drive. Suitable for grooving and flattening inside as well as outside seams.

Grooving Horn is pivoted at one end so that the other end can be swung outward to facilitate putting the work in position and removing it. It is made of heavy steel tubing, not solid, to avoid undue weight. Two adjustable aprons and a guide on the traveling gauge are provided to fix the position of the work.

Rolls. Three grooved rolls, $\frac{5}{16}$, $\frac{7}{16}$ and $\frac{9}{16}$ inch, and two flattening rolls are furnished. Grooves $\frac{5}{16}$, $\frac{7}{16}$ and $\frac{9}{16}$ inch wide are planed into the horn. The width of the seam must depend upon the thickness of the material.

Power Giant Groovers. A hand lever is used to start the carriage, which reverses automatically at the proper point and stops on returning to the original position. The reversing stops can be adjusted according to the length of the work.

Length	Diameter of Horn, About	For Hand			For Power		
		Code Word	Shipping Weight	Price	Code Word	Shipping Weight	Price
4 feet	3½ inches	Taslu	1,200 lbs.	$.....	Tasop	1,900 lbs.	$.....
6 feet	4 inches	Tasna	1,375 lbs.	.....	Tatih	2,150 lbs.	.....
8 feet	5 inches	.....	.....	.....	Tatjo	2,375 lbs.	.....
10 feet	5⅝ inches	.....	.....	.....	Tatmy	2,700 lbs.	.....



Double Seamers. Moore's, Hulbert' and Turret Seamers finish the bottom seam of cylindrical articles of sheet metal after the edges are flanged and set down. It is not necessary to stamp the bottoms with Press and Dies, as required for other types of Seamers.

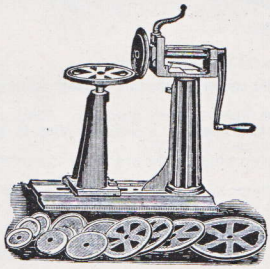
MOORE'S DOUBLE SEAMERS

Many sheet metal workers prefer this type of seamer for general use, as a variety of work can be done without changing working parts. The minimum diameter of the work is determined by the lower face.

The trolley wheel on the upper face lays the seam partly over. The upper shaft and face are then shifted laterally to complete the double seam.

Moore's Double Seamers — Number	1	3	4
Capacity ..... No.	26	28	26
Depth of throat ..... inches	15	10	29
Diameter of lower face ..... inches	4½	3	3½
Shipping weight ..... lbs.	100	70	370
Code word	Tatow	Tatum	Tatwa
Price ..... $	.....	.....	.....

HULBERT'S DOUBLE SEAMERS



For No. 26 iron and lighter

Of Double Seamers with horizontal discs, those of the Hulbert's type are the most satisfactory and easiest to operate. We offer them, therefore, in preference to others. Will double seam flaring, straight, oval and round work.

Deflector offsets and thereby stiffens the bottom, after seaming or soldering.

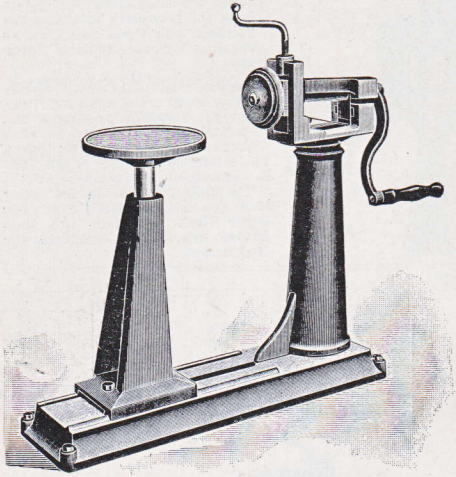
Price includes ten discs and three faces—Oval edge disc, 5⅞ inches diameter.

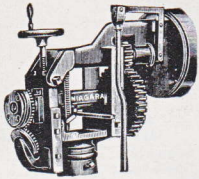
Flaring discs, 4⅛, 6¼, 7⅛, 8⅞, 11½ inches diameter.

Straight discs, 4¼, 5¾, 8⅛, 10¼ inches diameter.

Hulbert's Double Seamers	Code Word	Shipping Weight	Price
14 inches, with deflector	Tauan	135 lbs.	$.....
14 inches, without deflector	Taurl	130 lbs.	.....
20 inches, with deflector	Tauso	210 lbs.	.....

HEAVY HULBERT'S DOUBLE SEAMER





Power Drive and Setting Down Attachment

For No. 22 iron and lighter

Owing to its substantial construction, this Seamer will answer for comparatively heavy material.

Discs. Price includes one disc, 12 inch diameter. Discs of special sizes can be furnished at proper extra charge. A seaming disc of approximately the same diameter as the work should be used.

Height. To make the full working height available, the work must be not less than 13 inches diameter.

Power Attachment, with Clutch to control the motion, can be provided.

Setting Down Attachment can be applied, instead of using a separate machine for this purpose.

Heavy Hulbert's Double Seamer	Code Word	Shipping Weight	Price
36 inch	Tauts	450 lbs.	$.....
Power Attachment, with Clutch, extra			.....
Setting Down Attachment, extra			.....

For light material an extra upper face should be used.

HULBERT'S DOUBLE SEAMER FOR SQUARE WORK

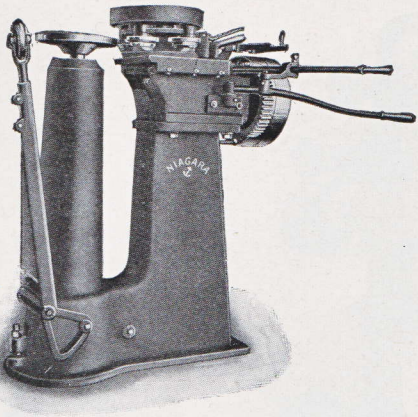
For No. 26 iron and lighter

It works on the same principle as other Hulbert's Seamers. The Double Seamer Head moves on a slide, while its rotary face acts upon the seam. Two parallel sides are usually seamed first, one at a time, then the position of the horizontal disc is changed for the other sides. A stop with index determines the proper positions.

Suitable for bottom seam not to exceed 22 inches long. Longer seams can be completed in sections by moving the work laterally after seaming it partly.

Seaming discs are required to suit the work and are charged for extra. Inquiries should give full particulars.

NIAGARA TURRET DOUBLE SEAMER—PATENTED



Cut shows Seamer with work support

This machine can be particularly recommended for seaming flat bottoms of tanks, drums, etc., made of material No. 18 to 24 gauge. A tight and uniform seam is produced. The bottom and body flanges must be sharp and of uniform width. A preceding setting down operation is not required, except on light stock. The work rests on the horizontal seaming disc. The double seaming head carries three rolls driven by gears. which are successively brought in contact with the seam until it is completed.

Work Support. When the seaming disc is not sufficiently large to hold the work in the proper position, it must be supported in some other manner. For medium size work we can furnish a work support similar to the illustration, at extra charge.

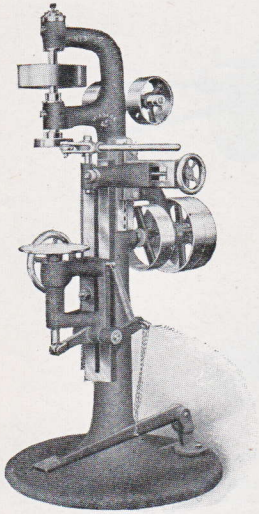
Discs. Price includes a seaming disc 12 inches diameter, suitable for work larger than this size. For work 9 to 12 inches diameter, an extra seaming disc can be furnished.

Rolls. Regular rolls are fitted for Nos. 18 to 20 gauge. Extra rolls are required for lighter material.

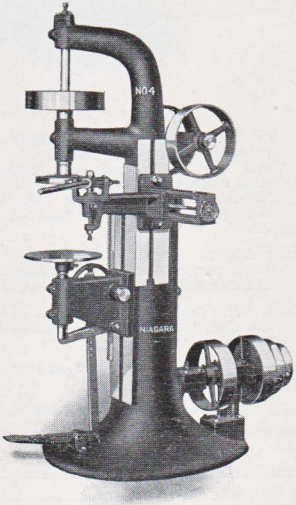
Clutch can be applied to control the motion.

Turret Double Seamers	Code Word	Shipping Weight	Price
36 inch, with T. & L. pulleys.....	Tavek	1,800 lbs.	$.....
48 inch, with T. & L. pulleys.....	Tavma	1,925 lbs.	.....
Clutch extra.			$.....

NIAGARA POWER DOUBLE SEAMERS, Nos. 1 TO 4



No. 3



No. 4, with step cone pulley

NIAGARA POWER DOUBLE SEAMERS—Nos. 1 to 4

Intended for double seaming the tops and bottoms of round articles of sheet metal, either straight or flaring. The work can be rapidly and perfectly double seamed by unskilled labor. The tops and bottoms must be stamped by means of Press and Dies, with a depression close to the edge for the seam and the ends of the body are flanged previously. Lower spindle has anti-friction bearing.

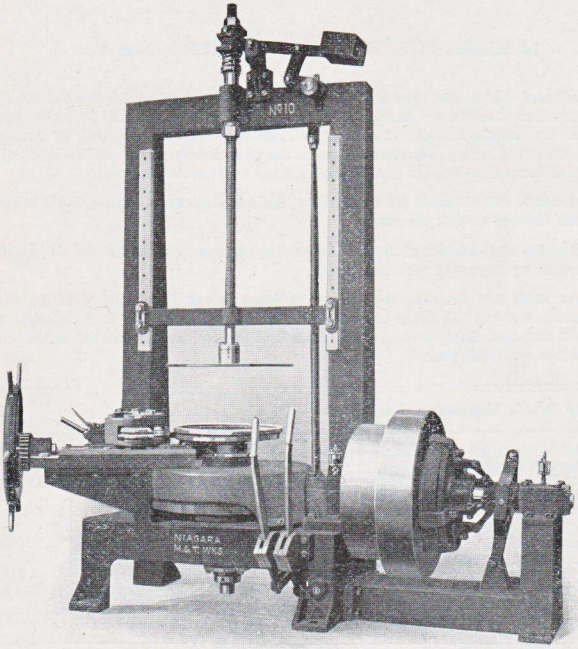
Nos. 1 and 2. The bracket for the lower spindle is stationary. The spindle is raised and lowered to suit the work.

Nos. 3 and 4. Adjustment of the lower clamping plate is made to suit the height of the article by means of rack and pinion.

Seamer Rolls and Chucks. Rolls must be fitted to suit the width of flange on the heads and the thickness of material. Chucks are machined to correspond with the size and shape of the heads. Rolls and chucks are charged for extra according to the requirements.

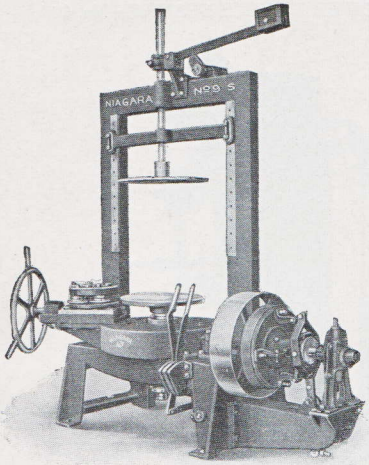
Power Double Seamers No.	1	2	3	4
For work in dia. up to...inches	6	9	15	20
For work in height up to.inches	6	10	16	27
Size of T. and L. pulleys.inches	6x2	7x3	9½x3	12x3¾
Speed of spindle.....R. P. M.	800-1,000	700-800	500-700	
Sizes of stepcone.....inches	.....	.....	.....	8-10-12
Size T. and L. pulleys on countershaft .....inches	.....	.....	.....	12x3¾
Speed of countershaft..R. P. M.	.....	.....	.....	300
Shipping weight.....lbs.	325	550	725	1,250
Code word	Tavoc	Tavud	Tawac	Tawgi
Price, with T. and L. pulleys, no seamer rolls or chuck...$	.....	.....	.....	.....

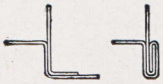
NIAGARA HEAVY POWER DOUBLE SEAMERS



No. 10

NIAGARA POWER DOUBLE SEAMERS





NO. 9

Intended for double-seaming the heads of steel barrels, drums, ash cans, etc., made of heavy material. The heads must be stamped with a depression close to edge for the seam and the bodies are flanged prior to seaming.

The work to be double seamed is clamped between the top plate and the lower seaming chuck, which is driven by bevel gears located underneath the bed. The chuck spindle has bronze-bushed bearing and provision is made for taking up end thrust.

The seaming rolls mounted on a turret slide are brought in contact with the work by means of screw and hand wheel, or power-driven actuating device can be furnished to special order. On No. 10 Seamer two speeds are provided for actuating the screw for heavier and lighter material.

Friction Clutch actuated by hand lever controls the motion. The controlling levers for clutch and clamping device are in convenient position for the operator.

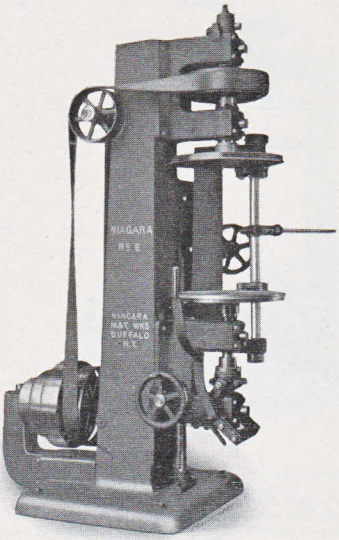
Two-Step Cone Pulley permits varying the speed according to the diameter of the work.

Countershaft is charged for extra, if wanted.

Seamer Rolls and Chucks. Rolls must be fitted to suit the width of flange on the heads and the thickness of material. Chucks are machined to correspond with the size and shape of the heads. Rolls and chucks are charged for extra, according to the requirements.

Power Double Seamers Number	9	10	10-S
For material up to....No.	16	12	12
With reg. slide for dia. from....in.	10 to 32	12 to 32	12 to 36
For work in height from....in.	6 to 44	6 to 44	6 to 60
Ratio of gearing....	5:1	7:1	7:1
Size of pulleys....in.	26x5	32x6	32x6
Speed of pulleys....R. P. M.	300 to 400	300	300
Height over all....in.	150	155	175
Floor space R-L, F-B....in.	90x42	106x48	106x48
Code word....	Tawly	Tawne	Tawrn
Weight, about....lbs.	4,050	6,200	6,600
Price....$	....	....	....

NIAGARA POWER DOUBLE SEAMER—No. 6



Designed for work of large size, such as oil tanks, asphalt and soda drums, garbage and ash cans, etc. It is necessary to stamp the heads to the proper shape by means of press and dies and to flange the body previously.

The machine can be arranged to double seam both ends at the same time; or to double seam the bottom and to hem the top edge of the body simultaneously; or to double seam each end separately.

The lower spindle is adjustable vertically to suit the height of the work, also the roll holders of the Double End Seamer. The vertical chuck spindles have end-thrust bearings. The work is clamped between the chucks by means of a lever on the side.

Step-Cone Pulley and Countershaft can be furnished to permit running slower on larger and faster on smaller diameters.

Seamer Rolls and Chucks. Rolls must be fitted to suit the width of flange on the heads and the thickness of material. Chucks are machined to correspond with the size and shape of the heads. Rolls and chucks are charged for extra, according to the requirements.

Power Double Seamers	No.	6	6-Geared
Single end, for material up to	No.	20	18
Double end, for material up to	No.	24	20
For work in diameter from	inches	10 to 26	10 to 26
For work in height from	inches	16 to 36	16 to 36
Size of T. & L. pulleys	inches	16x4½	16x4½
Ratio of gearing		.....	3:1
Speed of pulleys	R. P. M.	180 to 400	250 to 400
Shipping weight	lbs.	3,900	4,200
Code word		Tawtu	Tawva
Price	$	.....	.....

Forming Rolls—Intended for forming sheet metal in cylindrical shape. The capacity depends upon the diameter and length of the rolls.

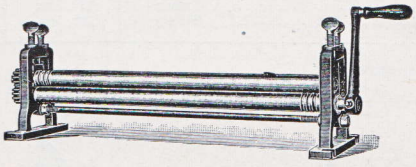
Rolls are made of steel. One of the feed rolls is adjustable for the thickness of the material and the rear roll according to the diameter to be formed. The gears are of steel.

Power Drive can be applied, at proper difference in price.

Iron Legs can be furnished for the smaller machines which are regularly furnished for bench use.

Wire Grooves are provided on all our Plain and Slip Roll Formers, 1½ inches diameter and larger. They permit forming sheets with wired edges and wire rings. The wire must pass through one of the grooves. Those on one end of the lower front roll and forming roll are used when the wire is to be towards the outside of the cylinder, and the grooves on the end of the top roll are for wire on the inside.

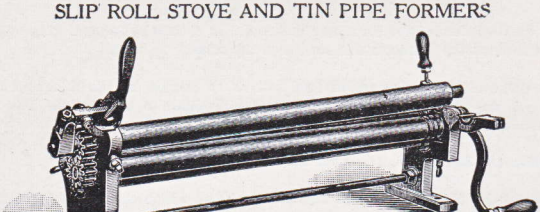
PLAIN FORMING ROLLS



The upper roll is adjustable for the thickness of material and the forming roll according to the diameter to be formed.

Plain Forming Rolls	Code Word	Shipping Wt.	Price
1½x20 inches	Taxbu	80 lbs.	$.....
2 x30 inches	Taxda	130 lbs.	.....
2 x37 inches	Taxed	150 lbs.	.....
2 x42 inches	Taxip	170 lbs.	.....
2½x30 inches	Taxro	220 lbs.	.....
2½x37 inches	Tayas	245 lbs.	.....
2½x42 inches	Tayir	270 lbs.	.....
Iron Legs, extra			$.....
T. and L. pulleys, extra.			.....

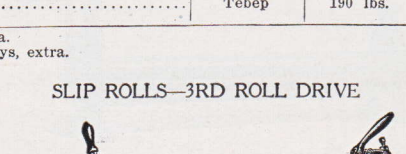
SLIP ROLL STOVE AND TIN PIPE FORMERS



Made with simple and quick-acting device, by means of which the one end of the upper roll can be raised and held suspended while removing the work which was formed around it.

Slip Roll Formers	Code Word	Shipping Wt.	Price
1 x16 inches	Tayst	45 lbs.	$.....
1½x20 inches	Tazez	85 lbs.	.....
1¾x30 inches	Tazho	135 lbs.	.....
2 x30 inches	Tazuc	150 lbs.	.....
2 x37 inches	Tebac	170 lbs.	.....
2 x42 inches	Tebep	190 lbs.	.....
Iron Legs, extra.			$.....
T. and L. pulleys, extra.			.....

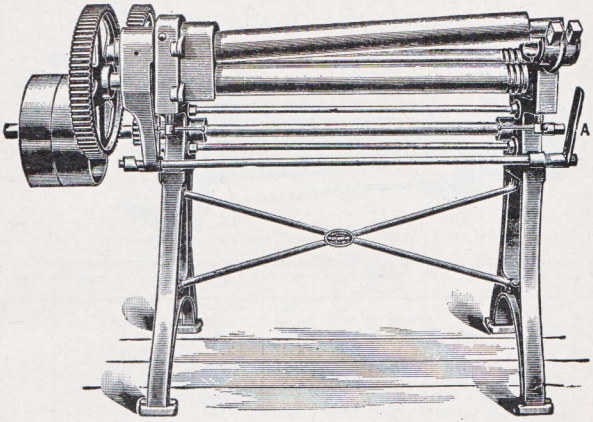
SLIP ROLLS—3RD ROLL DRIVE



On these machines the three rolls are driven by gears, contrary to the usual practice of driving the front feed rolls only. This arrangement makes it possible to set the front rolls sufficiently apart for material on which the edges were previously folded and to run such material through the rolls without compressing the hooks. It is also an advantage in forming work of small diameter.

Slip Rolls—3rd Roll Drive	Code Word	Shipping Wt.	Price
No. 12 Slip Rolls, 2x30 inches	Tebfi	155 lbs.	$.....

NIAGARA SLIP ROLL FORMING MACHINES



4x42-inch, double back geared, with T. and L. pulleys

These machines are well made and of substantial construction. The rolls are of steel and have grooves for forming wire. Other lengths besides those listed can be furnished.

Lifting Device is used to raise the one end of the upper roll and to hold it suspended while removing the work which was formed around it.

2½, 3 and 3½ inch Rolls. By means of an eccentric lever, the opposite end of the upper roll is raised, as shown on 3 inch rolls.

4 and 4½ inch Rolls. The upper roll is lifted by making a half turn with the handle on the right hand side, as shown in cut of 4 inch rolls.

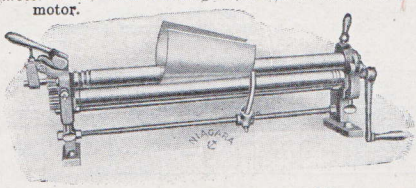
5 and 6 inch rolls have the raising lever on the left hand side, as shown in cut of 6 inch rolls.

Gearing. Single or double back gearing can be applied to facilitate forming heavier material. When hand driven, single back geared rolls can be run direct, and double back geared machines can be driven from the first gear shaft.

Forming Roll is adjustable by screws, and on 4 inch and larger machines sprocket wheels and chain are applied for simultaneous adjustment of both ends. On the regular machines the rear or forming roll is not driven by gears, but this can be arranged for, if desired. It is then possible to feed the material without setting the feed rolls quite so tight together.

Reversing Drive may be applied so that the rolls can be revolved in either direction and the motion stopped quickly.

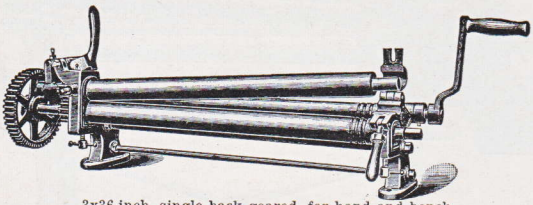
Motor Drive. Our Forming Rolls can be furnished for direct drive from an electric motor.



TAPER ATTACHMENT

It retards the narrow end in forming taper work and can be applied to Forming Rolls on which the three rolls are gear driven.

NIAGARA SLIP ROLL FORMING MACHINES



3x36-inch, single back geared, for hand and bench

Diam., About		Length, Inches	36	42	48	54	60
2½	Plain	lbs.	320	350			
		Code Word	Teceg	Tecit			
	Single back geared	Capac'y No.	16	16			
		lbs.	360	390			
		Code Word	Tecon	Tecpo			
3	Single back geared	lbs.	485	520	585		
		Code Word	Tecub	Tecve	Tedap		
	Double back geared	Capac'y No.	14	15	16		
		lbs.	520	560	625		
		Code Word	Tedby	Tedde	Tedeh		
3½	Double back geared	Capac'y No.	12	13	14		
		lbs.	780	840	900		
		Code Word	Teduc	Tedwi	Teeta		
4	Double back geared	Capac'y No.	10	11	12	13	
		lbs.	1,425	1,500	1,575	1,750	
		Code Word	Tefmi	Tefol	Tefsy	Tefzu	
4½	Double back geared	Capac'y No.	8	9	10	11	12
		lbs.	1,600	1,680	1,760	1,840	1,920
		Code Word	Tegay	Tegce	Tegek	Teghu	Tegix
5	Double back geared	Capac'y No.	6	7	8	9	10
		lbs.	1,950	2,070	2,200	2,325	2,450
		Code Word	Tegja	Tegop	Teguf	Tegvi	Tehac
6	Double back geared	Capac'y No.	3/8	5/16	2/8	¼	7/32
		lbs.	3,050	3,225	3,400	3,575	3,750
		Code Word	Tehdi	Tehen	Tehfo	Tehke	Tehoh

Actual length is about one inch more than the nominal size.

2½ to 3½-inch Rolls are regularly furnished for bench use.

4 to 6-inch Rolls are mounted on iron legs.

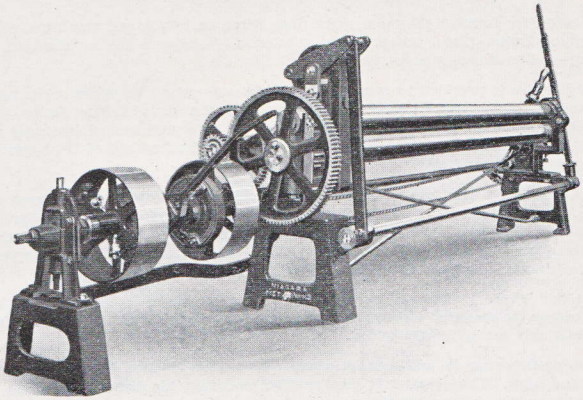
Power-Driven Rolls and **Gear Guards** for them are subject to extra charge.

Capacity. 2½ to 3½-inch single-back geared rolls will form No. 16 easily; 3-inch and larger rolls should be double back geared so they can be used to their full capacity.

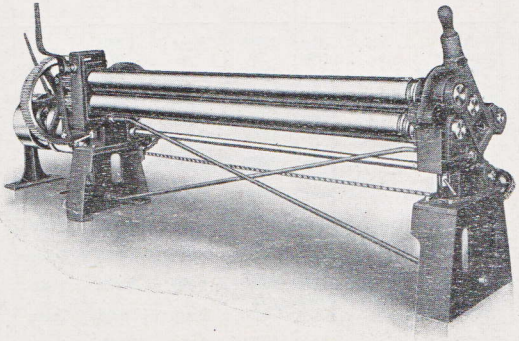
EXTRAS

	Code Word	2½"	3"	3½"	4"	4½"	5"	6"
T and L pulleys, extra	Tehpu	$....	$....	$....	$....	$....	$....	$....
Double friction clutch, extra	Tehsa	....	....	....	....	....	....	....
Gear drive for forming roll, extra	Tehuz	....	....	....	....	....	....	....
Iron legs, extra	Tejab	....	....	....	....	....	....	....

HEAVY SLIP ROLL FORMING MACHINES



6x120-inch Type B, double back geared, with double friction Clutch



6x120-inch, Type A, double back geared, with double friction Clutch

HEAVY SLIP ROLL FORMING MACHINES

Intended for forming sheets in cylindrical shape, in length and thickness within the stated limits. These machines are substantially and well made. The rolls are of steel and have wire grooves.

Lifting Device is provided by means of which the one end of the upper roll is raised and held suspended while the operator removes the work. Lifting device, **Type "A,"** is actuated by a hand lever located on the stationary end of the upper roll. **Type "B"** is actuated by a hand lever located on the free end of the upper roll on the right-hand side.

Roll Adjustment. The lower feed roll is adjustable by separate screws at each end. The forming roll is adjustable simultaneously at both ends by means of sprocket wheels and chain. Bevel gears for simultaneous adjustment of both ends of the forming roll or lower feed roll are sometimes provided at extra charge, or power device can be applied to the forming roll.

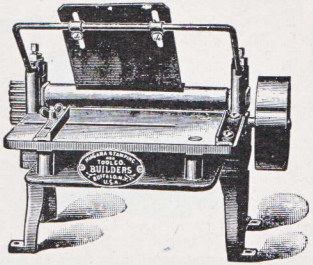
Third-Roll Drive. If desired, the forming roll can be driven by gears to facilitate feeding the material without having the feed rolls grip it tightly. The two front rolls only are ordinarily driven.

Reversing Drive can be arranged for, usually by Double Friction Clutch actuated by hand lever. The operator is then enabled to change the direction in which the rolls revolve and to stop the motion quickly.

Double Back-Geared Slip Rolls—Type "A," with T. & L. Pulleys

Approx. Diam., Inches	Length .....feet	6	7	8	9	10
4	Weight .....lbs.	2,050	2,200	2,350	.....	.....
	Capacity .....No.	16	18	20	.....	.....
	Code word.....	Tejot	Tejwo	Tekal	.....	.....
4½	Weight .....lbs.	2,400	2,600	2,800	3,000	3,200
	Capacity .....No.	14	16	18	20	20
	Code word.....	Tekci	Tekib	Tekje	Tekoz	Tekra
5	Weight .....lbs.	2,950	3,200	3,450	3,700	3,950
	Capacity .....No.	10	11	12	14	14
	Code word.....	Tekun	Telab	Telep	Telft	Telif
6	Weight .....lbs.	4,200	4,550	4,900	5,250	5,600
	Capacity .....inches	¼	3/32	1/8	1/8	1/8
	Code word.....	Telki	Telmo	Telns	Telop	Telpy
7	Weight .....lbs.	6,000	6,450	6,900	7,350	7,800
	Capacity .....inches	5/32	3/32	¼	3/16	5/32
	Code word.....	Telse	Telth	Telud	Telxu	Telza
7½	Weight .....lbs.	6,500	7,050	7,600	8,150	8,700
	Capacity .....inches	3/8	1/4	5/16	¼	¼
	Code word.....	Teman	Temck	Temeb	Temfu	Temha

POWER FORMING ROLLS



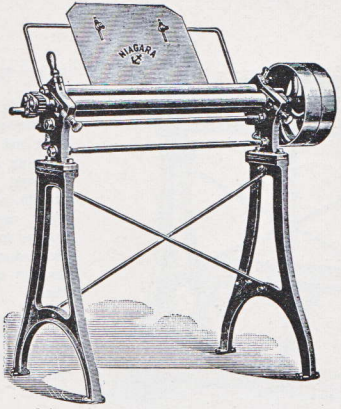
For forming round can bodies, etc. The feed rolls and forming shoe which is used in place of a third roll are made of steel. The gears are machine cut and the upper bearings are of bronze metal.

Knockoff Attachment prevents the work from forming around the upper roll and discharges it from the machine.

For taper work, special gauges are required, at extra cost.

Power Forming Rolls	Code Word	Shipping Wt.	Price
1 x 8 inch	Tebky	105 lbs.	$.....
1½x20 inch	Tebme	155 lbs.	.....

POWER FORMING ROLLS—No. 2

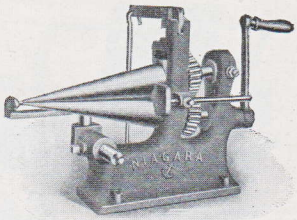


The three rolls are driven by gears. It is not necessary to set the front rolls tight together in order to feed the stock, and material can be formed with edges folded previously. Iron legs and T. & L. pulleys are provided.

Knockoff Attachment prevents the material from forming around the upper roll.

	Code Word	Shipping Wt.	Price
No. 2, 2x30 inch Power Forming Rolls..	Tebok	280 lbs.	$.....

FUNNEL FORMER



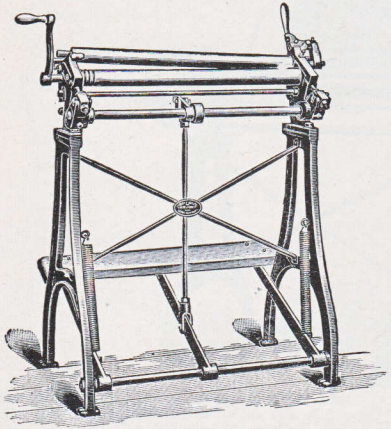
Intended for forming conical and taper work, such as funnels, can tops, etc.

No. 1. Rolls are ⅛ inch diameter at the small end, 2½ inches at the large end. The upper roll is depressed by treadle attachment. Tight pulley can be applied, at extra charge. No. 24 gauge can be formed to not less than 1 inch diameter at the small end and not less than 4 inches at the large end. On light material the small end can be formed to ½ inch and the large end to 3½ inches diameter.

No. 2 is an extra heavy machine, suitable for No. 18 iron and lighter, and has a crank screw for the upper roll. Rolls are 1 inch diameter at the small end, 4 inches at the large end.

Funnel Former	Length Rolls	Code Word	Ship. Wt.	Price
No. 1	10 inches	Tebsu	95 lbs.	$.....
No. 2	10 inches	Tebut	500 lbs.	.....

T. & L. pulleys to No. 2, extra. $.....



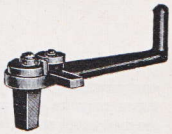
SLIP ROLLS FOR OVAL WORK

Adapted to forming oval, oblong and round cylinders. The forming roll can be raised and lowered by means of foot treadle attachment to the positions needed for the desired curves in forming oval and oblong shapes. Adjustable stops fix the upper and lower positions.

The upper roll has lifting device by means of which its one end can be raised and held suspended while removing the work.

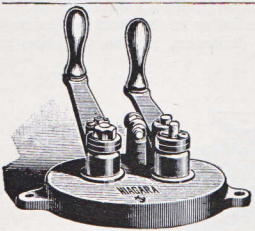
Slip Rolls for Oval Work	Code Word	Shipping Wt.	Price
2 x30 inches	Tebho	315 lbs.	$.....
2½x36 inches	Tebis	525 lbs.	.....

MILLER'S WIRE BAIL FORMER



For forming hooks on wire bails for buckets, etc. Suitable for $\frac{3}{16}$-inch and lighter wire. Gauge is graduated.

Net Weight	Code Word	Price
3 lbs.	Temig	$.....



NIAGARA OVAL HANDLE FORMER

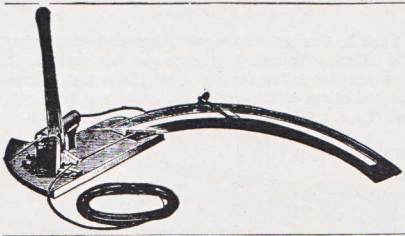
Suitable for forming oval handles, 3 to 3¾ inches inner length, of $\frac{3}{16}$-inch and lighter wire. Forming pieces for end curves of ½ inch and ⅝ inch radius are furnished.

Net Weight	Code Word	Price
7 lbs.	Temmp	$.....

WIRE STRAIGHTENER FOR HAND

For straightening wire from ⅛ to ¼ inch diameter. A pair of pliers is used to pull the wire through the rolls.

Net Weight	Code Word	Price
13 lbs.	Temof	$.....

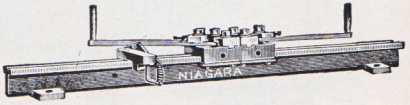


WIRE CUTTER AND BAIL FORMER

Wire is taken from the coil, gauged and cut to length. Will cut ¼-inch and lighter wire. The curved gauge with stop is graduated for lengths from 2 to 60 inches. Illustration shows the bail partly formed and with the bail handle in position.

Net Weight	Code Word	Price
31 lbs.	Tempz	$.....

NIAGARA WIRE FRAME BENDER



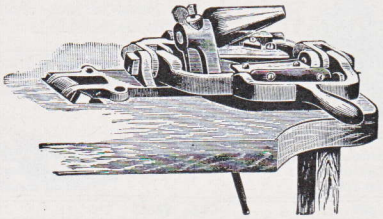
Intended for bending the wire frames which are inserted in the top edges of drip pans and similar work. Two bends are made at the same time, and the distance between the bends can be varied from 6 to 45 inches.

Suitable for wire up to ¼ inch diameter and to special order it may be arranged for flat stock.

	Code Word	Shipping Wt.	Price
Niagara Wire Frame Bender.....	Temti	135 lbs.	$.....

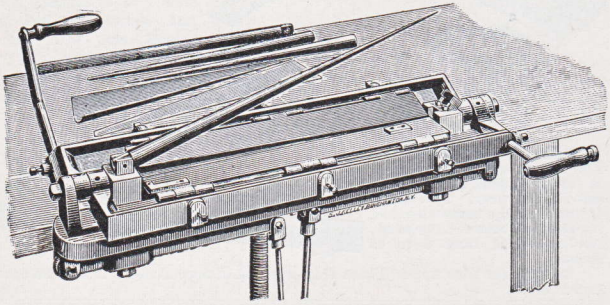
TUBE FORMERS

We have a variety of patterns for machines to form tubes of light material and comparatively small diameters, which cannot be produced with Forming Rolls. The tubes may be straight or taper, with butt, lap or lock seam. The hooks of lock seamed tubes must be folded previously and the seam closed with other devices. The machines are invariably made to special order, according to the exact requirements. Inquiries should give full information regarding diameters, lengths, thickness and nature of material, kind of seam, etc.



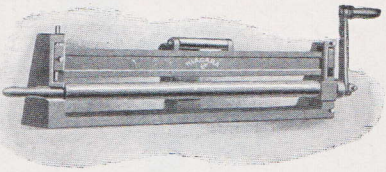
Type No. 1

Niagara Tube Formers—types 1 and 2. The material is partly formed between the die bed and mandrel when the latter is depressed by means of foot treadle. The tube is completed with the wings that follow the curvature of the mandrel which must conform with the size and shape of the work. For extra small tubes it is necessary to use a so-called "Breaker" for a preliminary forming operation.



Type No. 2

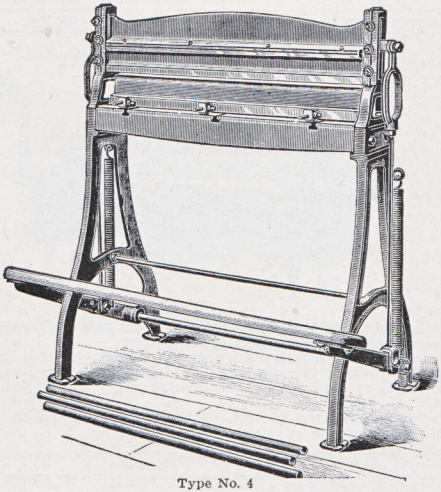
TUBE FORMERS



Type No. 3

Lock Seam Tube Formers—Type 3—can be arranged for forming tubes from 1 to 2½ inches diameter of No. 26 gauge, if 30 inches long. The hooks for the lock seam can be from $\frac{1}{16}$ to ¼ inch wide.

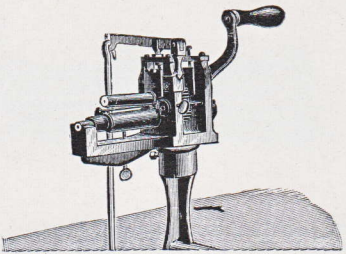
One of the folded edges is hooked into a groove on the mandrel and one turn of the mandrel forms the tube, while the holddown, actuated by foot treadle, exerts pressure upon the material. The two hooks snap into one another. The forming mandrel, except on short machines, is pivoted in the frame at the one end, that the operator can swing the other end outward to remove the work.



Type No. 4

Niagara Tube Former—Type 4—can be arranged for forming tubes with lap seam of comparatively small diameter, up to 36 inches long. A set of dies is required for each diameter.

TUBE FORMING ROLLS



Intended for forming short tubes of light material. The rolls are made of steel. The upper roll is depressed by a treadle attachment. A small bead can be made near the end of the tubes while forming them.

Smallest diameter, ⅞ inch; extreme length, 6½ inches.

	Code Word	Shipping Wt.	Price
No. 2 Tube Forming Rolls.....	Temul	60 lbs.	$.....

ROLLS FOR LAP JOINT PIPE

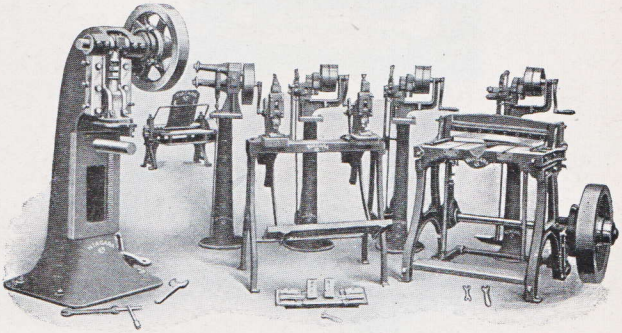
For forming tubes with lap seam that cannot be made with ordinary rolls, these machines are sometimes preferable to other devices.

The rolls and forming mandrel are arranged in pyramid form, the mandrel being located above and between the rolls. The mandrel is lowered by foot treadle to break the material and it can be freed from its bearing at one end to permit removing the formed pipe.

Extra mandrel is required for each diameter. Prices depend on diameter, length, thickness, etc., which should be stated.

Rolls for Lap Joint Pipe Number	1	2
Maximum length of tubes.....inches	12	30
Diameter of tubes.....inches	¾ to 1¼	1¼ to 2¾
Maximum metal thickness.....No.	28	24
Diameter of rolls.....inches	1	2
Shipping weight.....lbs.	100	250

MACHINERY FOR PIECED ELBOWS



We are making a specialty of outfits for pieced elbows and are prepared to furnish—

Squaring Shears of various sizes, for foot or power.

For Cutting the Sections—Curved Shears and Knives. Press and Dies.

Forming Rolls for hand or power.

Longitudinal Joint—Press and Dies for punching rivet holes, Folder and Groover for lock seam, Press with Duplex Side Seaming Attachment.

Circular Joint—Burring, Double Edging and Seam Closing Machines for hand or power; Crimping and Beading Machines, for hand or power.

Quotation. In order to quote an outfit, we must have the following particulars:

Diameters of the various sizes of elbows.

Number of pieces each elbow consists of.

Angle of elbows.

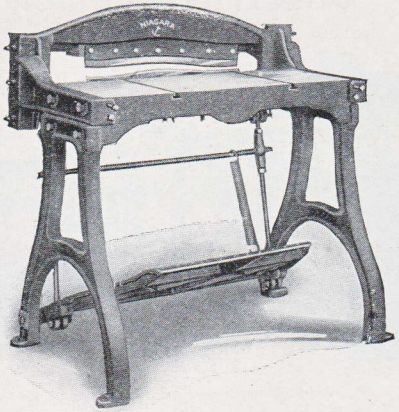
Type of circular joint preferred to suit your trade, and if tight or adjustable seam is desired.

Thickness and kind of material.

Whether the longitudinal joint is to be in the throat and riveted, or on the side of the elbow, in which case it can be lock seamed.

If hand or foot-operated machines are desired for small outfit, or power machinery for manufacturing purposes.

NIAGARA CURVED SHEARS AND KNIVES



Curved Shears are especially designed to accommodate Curved Knives which are fastened to cast iron blocks, for cutting the sections of pipe elbows and other curves. The Shears are made either for belt or foot power. The crosshead has long guides and end gibs. The cutter bar works as accurately as the slide of a Press.

Curved Knives are preferable to Dies, being cheaper and easier to keep in order.

Power Curved Shears. The motion is controlled by a positive clutch, which causes the cutter bar to descend after depressing the foot treadle and to stop on returning to the highest position, unless the treadle is kept depressed.

Capacity. Foot Shears, No. 20; Power Shears, No. 18 iron and lighter.

Price includes a set of front, back, bevel and side gauges, but no knives.

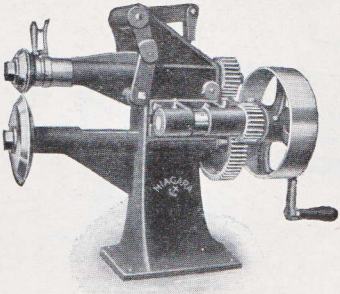
Curved Shears Inches	20	36	42	52	62
For elbows in dia. up to....in.	9	10	12	15	16
Foot Curved Shears.....$	.....	.....	.....	.....	.....
Shipping weight.....lbs.	700	975	1,175	.....	.....
Power Curved Shears.....$	.....	.....	.....	.....	.....
Shipping weight.....lbs.	.....	1,350	1,600	1,850	2,100

CURVED KNIVES AND BLOCKS

Prices are for knives to cut sections of 3, 4 or 5 pieced elbows, as may be ordered, 90 degrees and with the seam in the throat. Knives for elbows with seam on the side and for special angles are more expensive.

For elbows...inches	2	3	4	5	6	7	8
$	.....	.....	.....	.....	.....	.....	.....
For elbows...inches	9	10	11	12	14	16	.....
$	.....	.....	.....	.....	.....	.....	.....

ELBOW SEAM CLOSING MACHINES



Large Seam Closer with pulley

Intended to close and tighten the circular seam of pieced elbows. The edges are prepared with Burring Machine and Double Edge Turner, which must be equipped with special gauges for elbow work. The closing faces are made in halves, for tight and loose seams. Treadle attachment actuates the upper shaft.

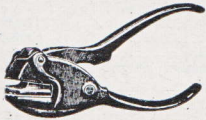
No. 4 Seam Closer is suitable for elbows from 3½ to 7 inches diameter. Depth of throat, 9 inches.

Large Seam Closer, with regular faces, answers for elbows from 7½ to 12 inches diameter. Depth of throat, 15½ inches. Special faces and connecting gears can be furnished for elbows of smaller diameter.

	Capacity	Code Word	Shipping Weight	Price
No. 4 Seam Closer.....	No. 26	Tenbi	100 lbs.	$.....
Large Seam Closer.....	No. 24	Tendo	180 lbs.	.....
T Pulley to No. 4, extra.....	.....	.....	.....	.....
Power Attachment, with Clutch, to Large Closer, extra.				

ROWE'S PIPE CRIMPER

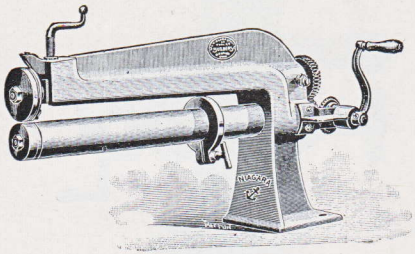
For No. 22 iron and lighter



It makes a gradual taper to facilitate joining lengths of pipe. Can also be used for enlarging the end of pipe by crimping and then flattening out.

	Code Word	Net Weight	Price
Rowe's Pipe Crimper.....	Takti	2¼ lbs.	$.....

MACHINES FOR SEAMING ROUND FURNACE PIPE



28-inch Furnace Pipe Seamer

We can furnish a set of machines for double seaming the circular joints of tin furnace pipe. The seam produced is perfect in tightness and appearance.

Large Burring Machine is used for burring the one end of a length of pipe.

Double Edge Turner, No. 2, which is similar to our Buffalo Elbow Edger, page 21, prepares the other end.

Power Bench Machines, page 27, are recommended for burring and double edging operations in manufacturing establishments.

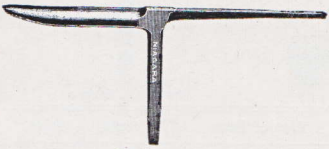
Furnace Pipe Seamer compresses the seam, turns it over, grooves and flattens it, without exchange of faces. Extension to lower shaft with guide roll is furnished to support the outer section of pipe.
20-inch—diameter of lower roll, $2\frac{7}{16}$ inches.
28-inch—diameter of lower roll, $3\frac{7}{16}$ inches.

	Code Word	Shipping Weight	Price
Double Edge Turner, No. 2, with standard.....	Tenot	36 lbs.	$.....
Treadle attachment to No. 2 Turner, extra.....	.....	.....	.....
20-inch Furnace Pipe Seamer.....	Tenpa	180 lbs.	.....
28-inch Furnace Pipe Seamer.....	Teoag	375 lbs.	.....
T Pulley to 20-inch Seamer, extra.....	.....	.....	.....
Clutch and Pulley to 28-inch Seamer, extra.....	.....	.....	.....

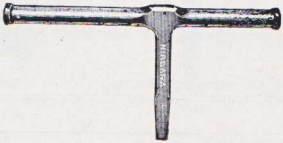
Beaded Joint for Round Furnace Pipe. Instead of double seaming, two sections of round furnace pipe are sometimes joined by beading the telescoping pipe ends. The rolls are usually made for two single beads ¼ inch wide, 1¾ inches apart from center to center, and they can be applied to our Furnace Pipe Seamers or Deep Throat Beaders.

TINNERS STAKES

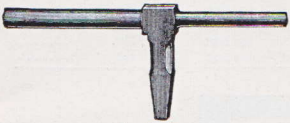
Wrought Iron with steel faces



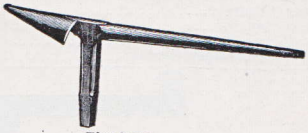
Beakhorn



Double Seaming



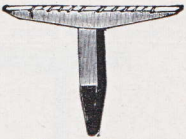
Conductor



Blowhorn

	End Length, In.	End Diam. In.	Weight	Price
No. 1 Beakhorn	round 16½, flat 21½	largest 2½	46 lbs.	$.....
No. 2 Beakhorn	round 16½, flat 20	largest 2¼	36 lbs.	.....
No. 4 Beakhorn	round 14½, flat 19	largest 2	28 lbs.	.....
No. 1 Dbl. Smg.....	large 17, small 12	1¾	42 lbs.	.....
No. 2 Dbl. Smg.....	both 11,	1¾	36 lbs.	.....
No. 0 Conductor ...	both 14,	1⅞ and 1⅜	26 lbs.	.....
No. 00 Conductor ...	long 20, short 14	2 and 1½	35 lbs.	.....
Blowhorn	long 17½, short 9	larg. 1½ and 4¾	14 lbs.	.....

Creasing, with Horn



Common Creasing

Candlemould

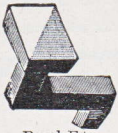
Needle Case

	End Length, In.	End Diam., In.	Weight	Price
Creasing with horn.	round 11½, flat 6¾	round 1½	12 lbs.	$.....
Common Creasing..	over all 14½		12 lbs.	.....
Candle Mould.....	long 18, horn 8¼	long ⅞, horn 1¼	8 lbs.	.....
Needle Case.....	flat 8, long 10	long ⅝	5 lbs.	.....

TINNERS' STAKES

Wrought Iron with Steel Faces

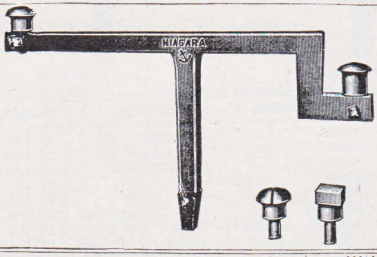
Coppersmith's Square



Bevel Edge

Common Square

	Size of Face	Weight	Price
Coppersmith's Square	2⅝x4½ inches	11 lbs.	$.....
Common Square	2⅝x4½ inches	12 lbs.	.....
Large Square	3½x5½ inches	15 lbs.	.....
Small Square	1½x2⅜ inches	3 lbs.	.....
No. 1 Bevel-Edged Square	3 x5 inches	14 lbs.	.....
No. 2 Bevel-Edged Square	2½x4½ inches	13 lbs.	.....



	Weight	Price
Teakettle with four heads; square head 2x3 inches; round head 2⅜x2 3/16 inches	50 lbs.	$.....

Hatchet

Bottom

Hatchet	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Net weight.....lbs.	11	9	8	7	5	4
Length of blade.....inches	16	14½	13	11	9	7
Price .....$	.....	.....	.....	.....	.....	.....

Bottom	No. 1	No. 2	No. 3	No. 4
Net weight.....lbs.	3	3	2	2
Width .....inches	1¾	1½	1¼	1
Price .....$	.....	.....	.....	.....

TINNERS' STAKES

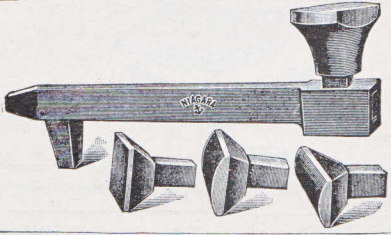
Cast Iron with polished Faces

Round Head

Solid Mandrel

Bath Tub

	Dimensions	Weight	Price
No. 1 Conductor	Large end 2¼x15 in., small end 1¼x12 in.	26 lbs.	$.....
No. 2 Conductor	Large end 1¾x14 in., small end 1¼x10 in.	20 lbs.	.....
No. 00 Solid Mandrel	60 in. long to standard, 3⅜ in. diam.	120 lbs.	.....
No. 0 Solid Mandrel	40 in. long to standard, 2¾ in. diam.	80 lbs.	.....
No. 1 Solid Mandrel	34 in. long to standard, 2½ in. diam.	60 lbs.	.....
No. 2 Solid Mandrel	30 in. long to standard, 2¼ in. diam.	45 lbs.	.....
No. 2½ Solid Mandrel	30 in. long to standard for 2 in. pipe	30 lbs.	.....
No. 3 Solid Mandrel	27 in. long to standard, 2 in. diam.	30 lbs.	.....
Round Head	Diam. of head 3¼ in.	10 lbs.	.....
Bath Tub	Width across top 3⅛ in.	12 lbs.	.....



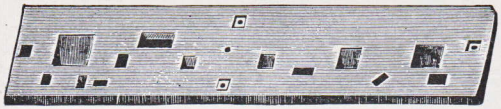
	Weight	Price
Double seaming stake with four heads		
round head 6 in. diameter, square head 4¼x5½ in.		
oval heads 8¼x2¾x2⅜ in. and 5⅝x4x3⅝ in.	90 lbs.	$.....

Hollow Mandrel	Dimensions	Weight	Price
No. 000	39 in. long, round part 3 in. diam., 30½ in. long	35 lbs.	$.....
No. 0	40 in. long, round part 4 in. diam., 32 in. long	50 lbs.	.....
No. 00	60 in. long, round part 4⅞ in. diam., 49½ in. long	80 lbs.	.....
Extra	48 in. long, round part 11¾ in. diam., flat part 15 in. wide	320 lbs.	.....

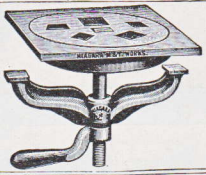
	Dimensions	Weight	Price
No. 12 Mandrel	Round part 26 in. entire length 44½ in.	50 lbs.	$.....

BENCH PLATES

They are fastened to a bench to hold Stakes and Bench Shears.



Bench Plates	Code Word	Net Weight	Price
No. 0, 48x12 inches.....	Tenes	70 lbs.	$.....
No. 1, 37x 8 inches.....	Tengy	50 lbs.	.....
No. 2, 30x 8 inches.....	Tenie	30 lbs.	.....



	Code Word	Net Weight	Price
Revolving Bench Plate, 9x9 inches...	Tennu	19 lbs.	$.....

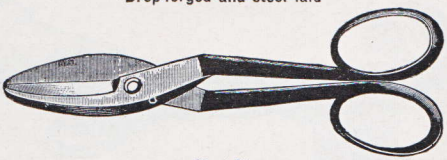
NIAGARA BENCH SHEAR HOLDER

Fastens to the bench like machine standards. The Bench Shear can be held in any position and at any desired angle.

	Code Word	Net Weight	Price
Bench Shear Holder.....	Tenum	17 lbs.	$.....

NIAGARA SNIPS

Drop-forged and steel laid



Straight

Niagara Snips are made to satisfy sheet metal workers, the most exacting users of snips. Drop-forged of refined iron, with high-grade tool steel welded to the jaws. The cutting parts are properly hardened, insuring a durable cutting edge.

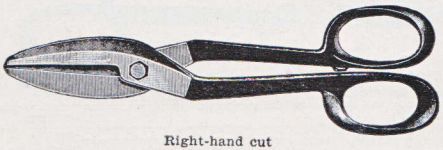
They are so ground and fitted that they will cut smoothly and easily. The bearing surfaces around the bolt holes fit closely.

These snips, being correctly proportioned, are strong and powerful, but not clumsy. The bows or loops are shaped to fit the hand. They will not lame and tire the operator in continuous use.

Niagara Snips — Number	6½	7	8	9	10
Length of jaws from pivot.....in.	4⅞	4½	4	3½	3⅛
Net weight.....ounces	52	42	32	26	19
Code word.....	Teolo	Tepez	Tepga	Tepim	Tepsi
Niagara Straight Snips.....per pair	$.....	.....	.....	.....	.....
Circle Snips (see Buffalo Snips).					

Quotations apply to regular Niagara and Buffalo Snips for right-hand operators and to cut on the left-hand side of the upper jaw. In addition, we can furnish, at extra charge—

Niagara and Buffalo Snips, Right-Hand Cut Nos. 8 and 18, cut on the right-hand side of the upper jaw and have handle bows shaped for right-hand use.

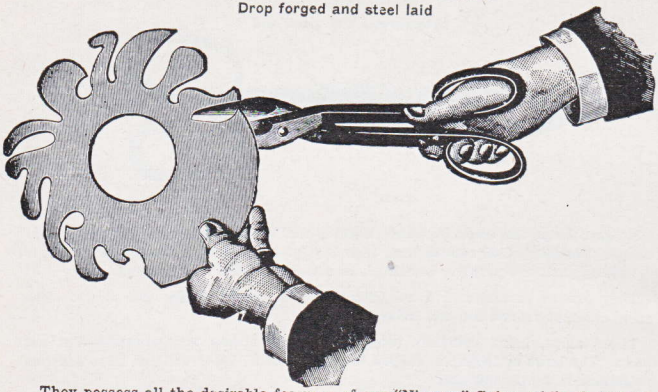


Right-hand cut

Snips for Left-Handed Workmen. Nos. 8 and 18, which cut on the right-hand side of the upper jaw and have handle bows shaped for the left hand.

BUFFALO COMBINATION SNIPS

Drop forged and steel laid

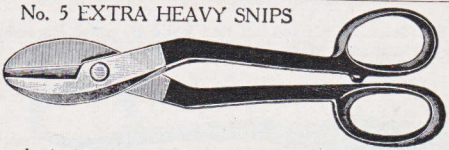


They possess all the desirable features of our "Niagara" Snips, while their jaws are so shaped that curves, scrolls and irregular shapes can be cut, as well as straight lines. The jaws allow the material to pass freely when cutting curves or changing the direction of the cut.

Buffalo Circle Snips. As it is very desirable that Snips with curved jaws intended to cut curves also have the jaws shaped "Buffalo" style, we decided to offer them exclusively.

Buffalo Snips	17	18	19
Length of jaws from cent. of pivot...in.	4½	4	3½
Net weight.....ounces	40	31	25
Code word.....	Teraz	Terco	Terds
Buffalo Straight Snips.....per pair	$.....	.....	.....
Code word.....	Terex	Terfy	Terid
Buffalo Circle Snips.....per pair	$.....	.....	.....

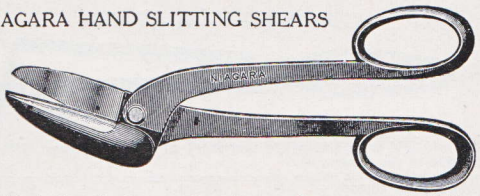
No. 5 EXTRA HEAVY SNIPS



They have short, stout jaws and long handles. Will cut No. 18 iron. Drop-forged and laid with hardened steel.

Extra Heavy Snips	Number	5
Length of jaws from center of pivot	inches	3
Length over all	inches	16
Net weight	ounces	64
Code word		Termu
Price	per pair	$.....

NIAGARA HAND SLITTING SHEARS



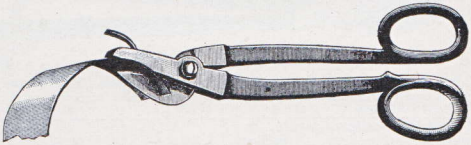
Distinguished through the peculiar shape and arrangement of the jaws and handles. The lower jaw is relieved to allow the material to slide backwards freely. Both handles remain above the work in cutting.

Sheets of any length can be cut apart without trouble or injury to the hands of the operator. Especially adapted to cutting corrugated sheets lengthwise.

Forged of solid steel, and the jaws laid with best cast steel, properly hardened. For No. 24 and lighter iron.

	Length	Code Word	Net Weight	Price
Niagara Hand-Slitting Shears, 3-inch cut.....	13½ inches	Teros	44 ounces	$.....

NIAGARA DOUBLE CUTTING SHEARS—FORGED



Drop-forged of refined iron. The center blade is of solid tool steel and the outer jaw is steel laid.

Will cut apart cylinders of sheet metal, such as stove pipe, without leaving ragged edges. Useful in cutting holes in sheets and cutting off the bottoms of cans, pails, etc. The center blade is pointed to be readily inserted into the metal, to start the cut.

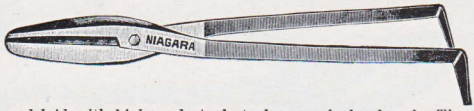
	Length	Code Word	Net Weight	Price
Niagara Double Cutting Shears....	13½ inches	Terrg	37 ounces	$.....

STRAIGHT EDGE

Made of steel, with beveled edge

Straight Edge	Code Word	Net Weight	Price
8 feet long, 2¼x¼.....	Tesew	13 lbs.	$.....

NIAGARA BENCH SHEARS



Forged and laid with high-grade tool steel, properly hardened. They cut on the right-hand side of the lower jaw.

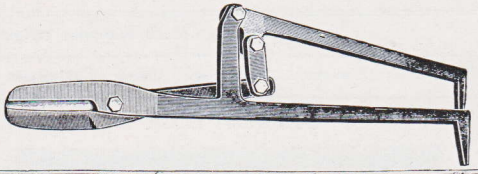
Niagara Bench Shears No.	00	0	1	2
Length of jaws from pivot.....in.	12¼	11	9½	9
Entire length.....in.	46	41	36	33
Net weight.....lbs.	36	31	22	20
Code word.....	Tesko	Tesob	Tespe	Tessh
Price .....$	.....	.....	.....	.....
Nos.	3	4	5	6
Length of jaws from pivot.....in.	8½	8	7	6
Entire length .....inches	31½	29	27½	25½
Net weight .....lbs.	15	11	9	7
Code word	Tesuk	Tesvu	Tesxa	Tetdu
Price .....$	.....	.....	.....	.....

ELBOW BENCH SHEARS

The jaws are rounded similar to those of Buffalo Snips. Forged and steel-laid.

Elbow Bench Shears	A	B	C
Length of jaws from cent. of pivot...in.	5¼	7	8½
Entire length.....inches	26½	33½	44
Net weight.....lbs.	10	17	33
Code word.....	Tetfa	Tetov	Tetri
Price .....$	.....	.....	.....

COMPOUND BENCH SHEARS



Compound Bench Shears No.	20
Length of jaws from center of pivot.....inches	8½
Entire length.....inches	46
Will cut soft steel up to.....inches	⅜
Net weight.....lbs.	52
Code word.....	Tetto
Price .....$	.....

RIVET SETS AND HEADERS

Forged of steel and hardened.

Nos.	00	0	1	2	3	4	5	6	7	8
Size of hole.....inch	5/16	9/32	1/4	7/32	3/16	11/64	5/32	3/64	1/8	7/64
For iron rivets...lbs.	14	10&12	8	6	4&5	2½&3	1¾&2	1½	1¼ oz.	10&12
Each .....$	...	.....	....	.....	.....	.....	.....	....	.....	.....

GROOVING TOOLS

Forged of steel and hardened.

Nos.	00	0	1	2	3	4	5	6	7	8
Sizes .....inch	½	7/16	3/8	5/16	¼	7/32	3/16	5/32	9/64	1/8
Each .....$	....	.....	.....	.....	...	..	.....	....	.....	.....

HOLLOW PUNCHES

Forged of tool steel and hardened.

Diameter .....inches	¼	3/8	½	5/8	¾	7/8	1	1⅛
Each .....$	...	...	...	...	...	...	...	...
Diameter .....inches	1¼	1⅜	1½	1⅝	1¾	1⅞	2	2⅛
Each .....$	...	...	...	...	...	...	...	...
Diameter .....inches	2¼	2⅜	2½	2⅝	2¾	2⅞	3	...
Each .....$	...	...	...	...	...	...	...	...

Hollow punches of regular sizes—per inch diameter. $.....
Other sizes can be made to order, at special prices.

SOLID PUNCHES—CAST STEEL

Nos.	0	1	2	3	4	5	6	7	8
Size of hole.....inch	9/32	¼	7/32	3/16	11/64	5/32	3/64	1/8	7/64

Solid Punches, Nos. 0, 1, 2, 3, 4, 5, 6, 7, 8, and Prick Punch.....each $.....
Set of Solid Punches, Nos. 3, 4, 5, Solid Punches, Prick Punch, ¾-inch Chisel and Lantern Chisel .....per set $.....

WIRE CHISELS

Wire Chisel

Lantern Chisel

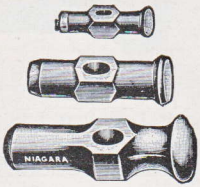
Wire Chisels...inches	¼	½	¾	1	1¼	1½	1¾	2
Each .....$								

Lantern Chisels, common size, each $.....

SCRATCH AWLS

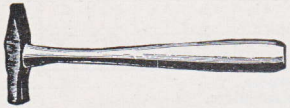
Per dozen .....$.....

RAISING HAMMERS



Nos.	1	2	3	4
Diameter of large face.....inches	2¼	2⅛	1¾	1⅜
Diameter of small face.....inches	1⅝	1½	1⅜	1⅛
Net weight .....lbs.	4¾	3½	2¾	1¾
Price with handle.....each	$.....	.....	.....	.....

RIVETING AND SETTING HAMMERS



Riveting Hammer

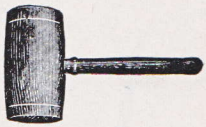
Setting Hammer

Nos.	1	2	3	4	5
Weight complete.....lbs.	1¾	1½	1	¾	½
Size of face.....inches	1⅛	1	⅞	¾	⅝
Riveting Hammers.....each	$.....	.....	.....	.....	.....
Setting Hammers.....each	.....	.....	.....	.....	.....

SOLDERING COPPERS

With square points for common use. With flat points for bottoms.

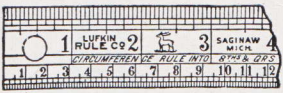
TINNERS' MALLETS



Made of seasoned hickory wood.

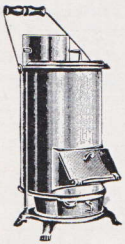
2	to 3 inches, assorted.....per dozen	$.....
3	inches.....per dozen	.....
3½	inches.....per dozen	.....
4	inches.....per dozen	.....

STEEL CIRCUMFERENCE RULE



This rule gives the circumference of circles by simply measuring the diameters. The top edge is a rule graduated in sixteenths inch. The bottom edge indicates the circumference of circles, which are equal in diameter to the measurement given directly opposite on the other edge. The reverse side gives useful table of measurements.

	Code Word	Price
36 inches long, plain.....each	Teutp	$.....
36 inches long, nickeled.....each	Teuwz	.....

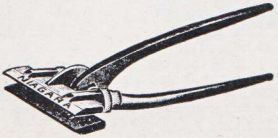


BUTTLE'S CHARCOAL FIRE POT

This base-burning tinners' Fire Pot has double damper and reversible flue. Height, 16½ inches; opening, 3¾x2¼ inches.

Shipping Weight	Code Word	Price
16 lbs.	Teuzi	$.....

HANDY TONGS



A most useful tool for sheet metal workers. Gauge is adjustable from ⅜ to 1⅛ inch. Blades, 6½ inches long.

	Code Word	Net Weight	Price
Handy Tongs.....each	Tevat	3 lbs.	$.....

TOOLS FOR SHEET METAL ROOFING

Steel Roofing Tongs

Gutter Tongs

Adjustable Roofing Tongs

Steel Roofing Tongs. Intended for turning the edges of roofing sheets, as the first step in making a seam.

Steel blades are 18 inches long and well finished. The handles are forged

Regular sizes: ½, 1, 1¼, 1½, 1¾ inches.

Set of common gauge Roofing Tongs, 1 and 1¼ inches.

Set of wide gauge Roofing Tongs, 1¼ and 1½ inches.

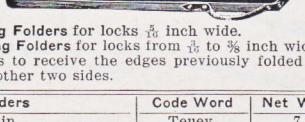
Adjustable Roofing Tongs. Steel blades are 18 inches long and well finished. The handles are forged.

Each pair of Tongs is suitable for edges ½, ¾, 1, 1¼, 1½ and 2 inches wide. The adjusting pins are screwed in the proper positions according to the desired width of edge.

Gutter Tongs. Steel blades 14 inches long, forged handles. Depth of throat 14 inches.

	Code Word	Net Weight	Price
Steel Roofing Tongs, per set of two	Tetye	16 lbs.	$.....
Adjustable Roofing Tongs, each	Teubo	9 lbs.	.....
Gutter Tongs, each	Teucs	9 lbs.	.....

WOOD ROOFING FOLDERS

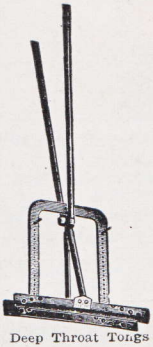


Common Wood Roofing Folders for locks $\frac{5}{16}$ inch wide.

Improved Wood Roofing Folders for locks from $\frac{1}{16}$ to $\frac{3}{8}$ inch wide. There are recesses in the steel blades to receive the edges previously folded on two parallel sides when folding the other two sides.

Wood Roofing Folders	Code Word	Net Weight	Price
Common, for 20 inch tin	Teuey	7 lbs.	$.....
Common, for 28 inch tin	Teuge	11 lbs.	.....
Improved, for 20 inch tin	Teulu	9 lbs.	.....
Improved, for 30 inch tin	Teuod	15 lbs.	.....

TOOLS FOR SHEET METAL ROOFING



Deep Throat Tongs

Clamp Tongs

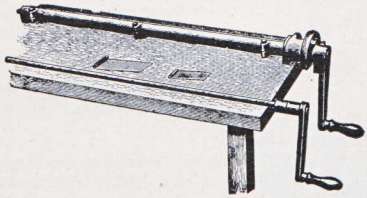
Deep Throat Tongs. Steel blades, 15 inches long. Adjustable from ½ to 10 inches, varying by ½ inch.

Clamp Tongs. Intended to draw the two layers of tin roofing together before putting on the cleats.

Steel blades 6 inches long, throat 6 inches deep.

	Code Word	Net Weight	Price
Deep Throat Roofing Tongs, each.....	Teusm	11 lbs.	$.....
Clamp Tongs, each.....	Tevhi	6 lbs.	.....

NIAGARA SINGLE AND DOUBLE LOCK EDGER

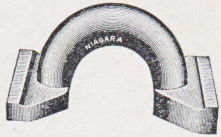


Intended for turning single and double locks on the edges of roofing sheets of light tin. One turn of the crank handle is required and the angle of the lock is fixed by stops. It can also be used as an ordinary Gutter Beader.

Price includes edging rod single locks about ⅛ inch, double locks about ⅜ inch wide, also Gutter Rod ½ inch diameter.

	Code Word	Shipping Wt.	Price
30-inch Single and Double Lock Edger.	Tevip	45 lbs.	$.....

HAND ROOFING DOUBLE SEAMERS



The standing seam of sheet metal roofing is finished on these blocks after the edges were turned with tongs.

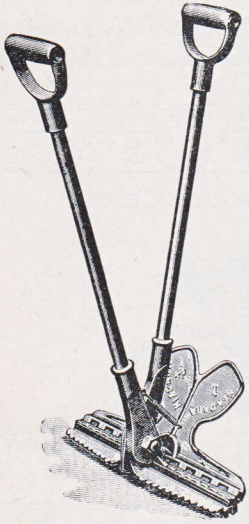
Each Seamer is made for two widths of the regular sizes, ½x¾, ¾x1, 1x1¼, 1¼x1½, 1½x1¾ inches. In case of order, state sizes wanted.

Common Gauge Seamers follow 1 and 1¼-inch tongs. Code word—Tevks.

Wide Gauge Seamers follow 1¼ and 1½-inch tongs. Code word—Tevux.

	Net Weight	Price
Hand Roofing Double Seamers.....per set of two	15 lbs.	$.....

BURRITTS' ROOFING DOUBLE SEAMERS—IMPROVED



These tools are used to complete the standing seam of tin roofing, after the edges were turned with Tongs.

The edge is bent beyond right angles at the first operation to facilitate closing down. The Seamers do not crimp the tin and they leave the locks of uniform height. Will double seam hips and ridges with ease.

Ordinarily fitted for IC tin, unless specially ordered for IX tin to follow 1¼ and 1½-inch Tongs.

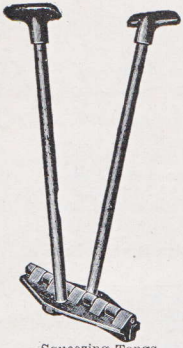
Common Gauge Seamers follow 1 and 1¼-inch Tongs, finished seam ¾ inch high. Code word—Tevjo

Wide Gauge Seamers follow 1¼ and 1½-inch Tongs, finished seam 1 inch high. Code word—Tevyg.

When ordering, state if common or wide-gauge Seamers are wanted.

	Net Weight	Price
Burritts' Roofing Seamers.....per set of 2 pairs	45 lbs.	$.....

TOOLS FOR STEEL ROOFING



Squeezing Tongs

Malleable Edging Tongs

Single Seaming Tongs

Squeezing Tongs. Used for roll cap and pressed standing seam roofing and suitable for seam up to 1 inch high. The jaws are of cast iron, 11½ inches long. No. 2 presses two indentations while squeezing the seam.

Malleable Edging Tongs. Used for roll and folding cap roofing and made for edges 1 or 1½ inches high.

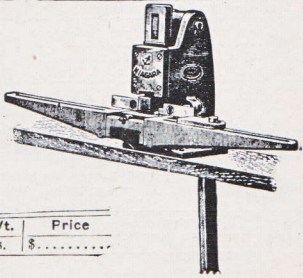
For double seam roofing our Steel Roofing Tongs should be used, as they make a sharper bend.

Single Seam Tongs. Used in connection with 1 and 1½ inch Roofing Tongs. They turn the high edge at right angles, which is then laid down against the lower flange by means of the Squeezing Tongs. Blades are 10 inches long.

	Code Word	Net Weight	Price
Squeezing Tongs—No. 1.....per pair	Tevmy	15 lbs.	$.....
Squeezing Tongs—No. 2.....per pair	Tevwa	15 lbs.	.....
Malleable Edging Tongs—1 inch.....per pair	Tewcu	10 lbs.	.....
Malleable Edging Tongs—1½ inch.....per pair	Tewef	11 lbs.	.....
Single Seaming Tongs.....per pair	Tewoa	18 lbs.	.....

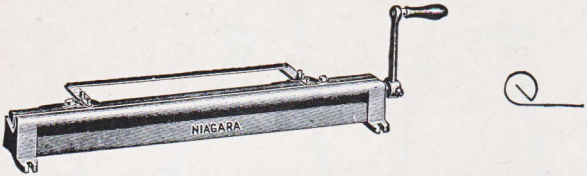
NIAGARA NOTCHING MACHINE

For notching sheet metal for wiring and grooving, for cutting corner and hinge notches, etc. The rectangular die is suitable for notches up to 1½ inches wide and 2 inches deep. Adjustable side and back gauges are provided, and several thicknesses of light tin can be cut at the same time.



	Code Word	Ship. Wt.	Price
Niagara Notcher	Tlurn	160 lbs.	$.....

NIAGARA ADJUSTABLE GUTTER BEADERS



Intended to round and stiffen the edge of gutter by forming a so-called bead.

Rods from ⅜ to ¾ inch diameter can be used in the frame of Adjustable Gutter Beaders. The two jaws can be spread apart to facilitate removing the work and rod. Stops fix the working position of the movable jaw.

Price includes one rod of regular sizes (see below).

Unless otherwise ordered, we furnish ½-inch rod for Gutter Beaders 30 to 48 inches and ⅝-inch rod for 5 to 10-foot machines.

Adjustable Gutter Beaders	Code Word	Shipping Wt.	Price
30 inch	Tewpi	60 lbs.	$.....
42 inch	Tewso	100 lbs.	.....
48 inch	Tewts	120 lbs.	.....
60 inch	Tlimp	210 lbs.	.....
96 inch	Tlint	335 lbs.	.....
120 inch	Tliow	400 lbs.	.....

IRON BOTTOM GUTTER BEADERS

Each Iron Bottom Gutter Beader is made for one size of rod only.

Price includes one rod of the regular sizes (see below). Unless otherwise ordered, we send ½-inch rod with 20 to 42-inch, and ⅝-inch rod with 60-inch Iron Bottom Gutter Beaders.

Iron Bottom Gutter Beaders	Code Word	Net Weight	Price
20 inch	Tlirc	10 lbs.	$.....
30 inch	Tlisf	16 lbs.	.....
42 inch	Tlolt	52 lbs.	.....
60 inch	Tlonz	100 lbs.	.....

STEEL GUTTER RODS

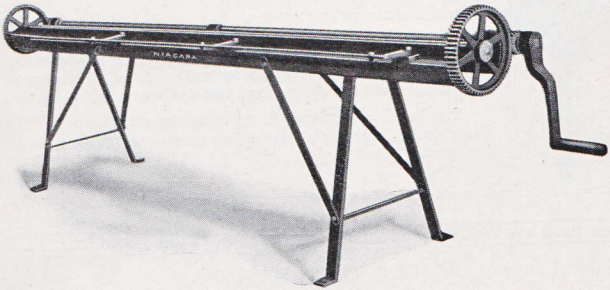
Regular Sizes—For 20 to 30-inch Gutter Beaders ⅜, ½ and ⅝ inch diameter; for 42 to 48-inch Gutter Beaders ½, ⅝ and ¾ inch diameter; for 60 to 120-inch Gutter Beaders ⅝ and ¾ inch diameter.

Rods of special diameters can be made to order.

Rods longer than 30 inches have a handle at each end.

Length .....inches	20	30	42	48	60	96	120
Price .....$	.....	.....	.....	.....	.....		.....

GEARED GUTTER BEADER



In order to secure uniform motion of long gutter rods, both ends of this machine are turned simultaneously by gears. There is a crank handle at each end.

The jaws of the machine which form the seat for the rod are adjustable from ⅝ to 1 inch diameter. When the bead is formed they can be spread apart from either end to facilitate taking out the work, the gear on the right-hand end being removable.

10-Ft. Geared Gutter Beader is suitable for No. 24 iron if a ⅝-inch rod is used; for No. 22, with ¾-inch rod. Somewhat heavier material can be beaded if the edge is turned previously with a Folder.

	Code Word	Shipping Weight	Price
Geared Gutter Beader, 10 ft. long, with ⅝-in. rod	Tlopf	500 lbs.	$.....

SLATER'S TOOLS

Stake

Ripper

Hammer

Ripper has a tool steel blade 20 inches long.
Hammer is forged of steel, tempered and nicely polished.
Stake is 18 inches long, forged of steel.

	Code Word	Net Weight	Price
Slaters' Ripper	Tlowy	3¼ lbs.	$.....
Slaters' Hammer	Tloye	1¾ lbs.	.....
Slaters' Stake	Tlubt	3 lbs.	.....

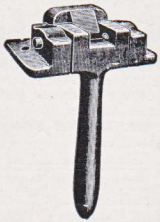
NIAGARA BRACE & WIRE BENDERS

Intended for making braces up to 3½ inches wide for gutters, leaders, cornices, etc. The clamping jaw can be adjusted for various thicknesses of material up to ¼ inch, by means of the set screws on top, also laterally by means of the set screws in the rear, for forming sharper and rounder bends, ogees, etc.

The handle can be used in the center or on either side. The clamping jaw is reversible and it has grooves of different widths for bending wire.

	Code Word	Shipping Wt.	Price
Niagara Brace and Wire Bender	Tloto	80 lbs.	$.....

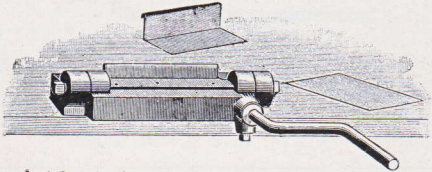
BRACE & CLEAT BENDERS



Adapted to bending braces for gutters, leaders, etc. Will bend various thicknesses up to ¼ inch. They do not make sharp bends.

Brace and Cleat Benders	Code Word	Net Weight	Price
No. 2—2 inches wide..	Tlous	26 lbs.	$.....

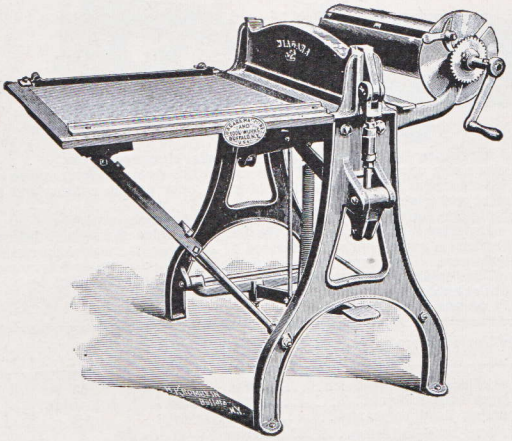
NIAGARA CLEAT FORMER



Will form a cleat for standing seam roofing complete at one operation. No. 2 for 1¼ and 1½-inch cleats up to 2½ inches long.

Cleat Formers	Code Word	Net Weight	Price
No. 2.....	Tlumb	6½ lbs.	$.....

NIAGARA CROSS LOCK SEAMER



Intended for compressing the single lock seams of roofing sheets No. 26 and lighter, and for putting it up in rolls, ready to lay on the roof. The seam is tight and uniform the entire length.

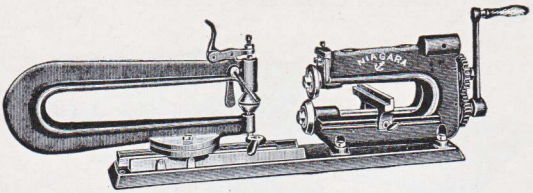
Compressing Bar is operated by a powerful toggle movement. The proper position of the sheets is given by two spring pins on the compressing bar.

Extension Table carries two side gauges, adjustable for 20 and 28 inch tin, one stationary and the other backed by springs. The table is hinged to the frame.

Reel in the rear of the machine is covered with sheet steel and its movement is controlled by ratchet and pawl. Provision is made that the seams can be soldered before winding the sheets onto the reel. The finished rolls of tin can be removed without difficulty.

Niagara Cross Lock Seamer	Code Word	Shipping Wt.	Price
No. 1, 30 inch.....	Tlutu	600 lbs.	$.....

NIAGARA WAUGH'S CIRCLE SHEARS



Intended for cutting light sheet metal into circular shape or strips.

Cutters are made of a special quality of high grade tool steel, properly hardened and ground. Adjustment is provided for taking up wear on the cutters and for the thickness of material to be cut.

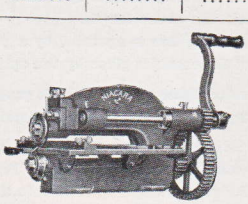
Slitting Gauge in the cutting head is readily adjusted for various widths.

Circle Arm. Its throat permits cutting the largest circles mentioned below from square blanks. A graduated scale, divided in $\frac{1}{16}$ inches, is marked on the support of the circle arm. The proper position of the blank is determined by a swinging gauge and the cutters. The material is clamped between the discs by means of an eccentric device.

No. 16 is back geared at the ratio of 4:1.

Waugh's Circle Shears No.	2	4	16
Will cut in thickness incl. .....No.	22	22	16
Will circle from square blank.....inches	3 to 22	3½ to 48	4 to 48
Throat of cutting head to frame.....inches	9¾	9¾	13
Throat of cutting head to frame.....inches	9	9	12½
Throat of circle arm.....inches	16	34	36
Will gauge in width not less than.....inches	½	½	¾
Shipping weight.....lbs.	120	295	480
Code word.....	Toagi	Toaly	Toane
Price of Circle Shears.....$	.....	.....	.....

NIAGARA ROTARY SLITTING SHEARS

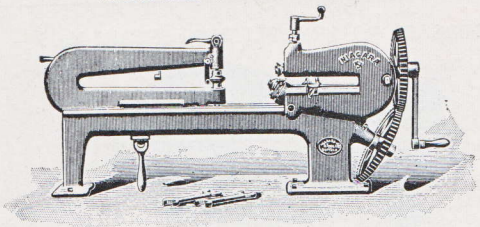


These Shears are similar to the cutting heads of our Waugh's Circle Shears. They are made to bolt to a work bench and equipped with a table carrying an adjustable slitting gauge.

No. 2 will gauge in width not less than ½ inch; No. 16, ¾ inch.

Slitting Shears	Capacity	Throat to Frame	Code Word	Shipping Weight	Price
No. 2	No. 22	9¾ inches	Toaoh	95 lbs.	$.....
No. 16, geared.....	No. 16	13 inches	Toarn	245 lbs.	.....

RING AND CIRCLE SHEARS



Suitable for cutting holes or internal circles and irregular curves, as well as for cutting outside circles and slitting.

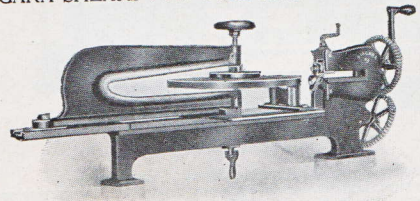
Cutters are made of a special quality of high grade tool steel, properly hardened and ground. Adjustment is provided for taking up wear on the cutters and for the thickness of material. The upper cutter can be raised and lowered to penetrate the stock.

Slitting Gauge in the cutting head is readily adjustable for various widths.

Circle Arm. Its throat permits cutting the largest circles mentioned below from square blanks. A graduated scale divided in $\frac{1}{16}$ inches is marked on the support of the circle arm. The proper position of the blanks is determined by two drop gauges and the cutters. The material is clamped between the disc by means of an eccentric device.

Ring and Circle Shears	Numbers	11	13
Will cut in thickness incl.	No.	20	20
Will circle from square blank	inches	3½ to 22	3½ to 42
Throat of cutting head to frame	"	9¼	9¼
Throat of cutting head to gauge	"	9	9
Throat of circle arm	"	16	30
Shipping weight	lbs.	210	290
Code word		Toaux	Toava
Price			

NIAGARA SHEARS FOR OVAL AND OBLONG WORK



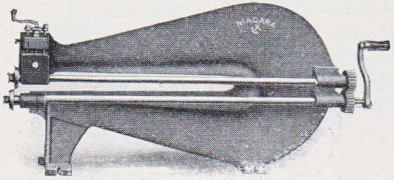
Particularly intended for cutting oval and oblong shapes of sheet metal up to No. 22 gauge. A cam is required for each shape. The work may be up to 40 inches long, but the radius of the end curves must not be less than 5 inches.

The sheet is clamped between the cam and upper discs, the outside of the cam resting on a support with idlers. The clamping arm, which is pivoted at the outer end, swings sideways during the cutting operation according to the shape to be cut.

Circle Arm with 30-inch throat, substituted for the oval attachment, makes the machine suitable for cutting inside and outside circles.

Inquiries should give full particulars regarding shapes, dimensions, thickness, etc.

NIAGARA ROTARY SPLITTING SHEARS No. 9

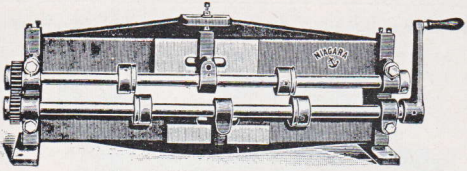


It has a deep throat to permit cutting sheets a considerable distance from the edge. Useful in the manufacture of culverts, tanks, etc. Flat and corrugated sheets can be cut parallel to the edge of the material, or on a slant, and it is possible to cut across sheets with standard corrugations without materially distorting the stock.

The upper cutter can be raised ½ inch above the lower cutter to permit putting the material into place.

Rotary Slitter — No.	9
Will cut iron in thickness incl. .....No.	20
Depth of throat.....inches	42½
Diameter of cutters.....inches	3½
Shipping weight.....lbs.	925
No. 9 Slitting Shears, for hand (code word, Toawd).....$	.....
No. 9 Slitting Shears, with T. and L. pulleys (code word, Toazm)....$	.....

DUPLEX ROTARY SPLITTING SHEARS



Capacity No. 20 iron and lighter

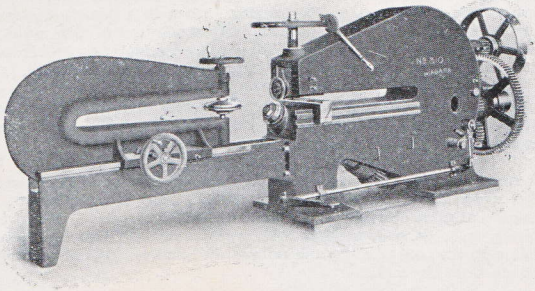
Intended for cutting apart or trimming sheets of any length.

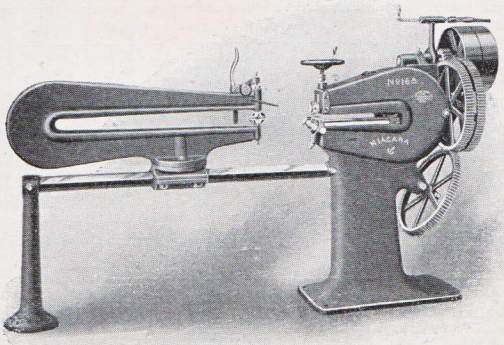
The users may sink the machine into a work bench, with the upper surface of the lower cutter flush with the bench and provide gauges at right angles to the machine, one stationary and the other adjustable for different widths of sheets according to the prevailing conditions.

Cutters are mounted on cast iron hubs and can be fastened to the shafts in various positions. The distance between the cutters is adjustable from 3½ to 30½ inches. The brackets carrying the upper cutters can be lowered to permit taking up wear.

Duplex Rotary Slitter	Code Word	Shipping Weight	Price
30 inch, with two pairs of cutters.....	Tobaz	300 lbs.	$.....

NIAGARA CIRCLE AND SLITTING SHEARS





Made with or without circle attachment, capacity up to ¼ inch soft steel

NIAGARA CIRCLE SHEARS WITH FLANGING ATTACHMENT

Intended for cutting discs of sheet metal and flanging them to form bottoms for metal barrels, tanks, etc. They are particularly useful where a variety of diameters is required. We offer these machines, which are suitable for a large range of cutting and flanging work, for but little more than the prices of ordinary Circle Shears. Illustrations show machines set up for flanging. When it is desired to use them for cutting, the flanging rolls are removed and cutters substituted. The upper shaft and roll are laterally adjustable for the thickness of material. Two holddown rolls are mounted on a slide in front of the upper flanging roll to avoid distortion.

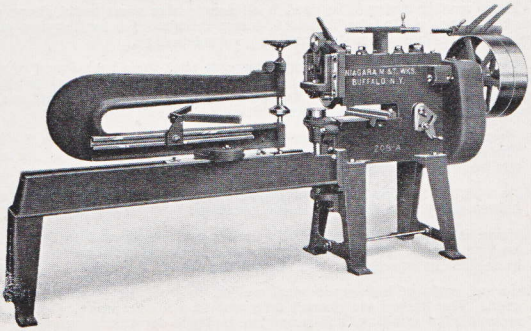
Flanging Rolls regularly furnished with the heavier machines round the corners more than those fitted specially for lighter material, and it is desirable at times to order extra rolls fitted for lighter stock.

Circle Arm of No. 208-A can be adjusted for flanging discs up to 74 inches diameter. For larger diameters, the center pin method, page 42, may be used. We can furnish, at extra charge, a circle arm with 52-inch throat. If so desired, the 52-inch arm can be made to swing sideways (see page 43), instead of remaining in line with the bed, to clamp the material in rounding the ends of large bottom sheets for oblong tanks.

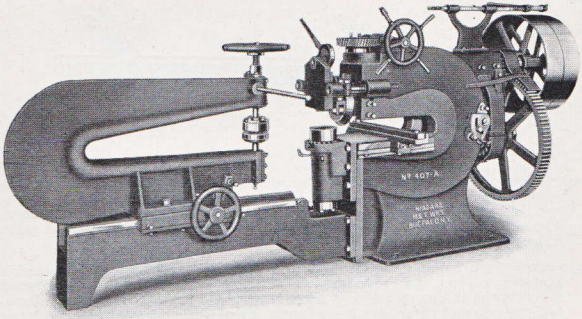
No. 407-A. The regular price includes an ordinary circle arm and cast iron bed for it. To special order it can be furnished with extra long bed and double circle arm for circles up to 12 feet diameter.

Number	407-A	208-A	195	05
Weight .....lbs.	6,700	2,300	4,500	850
Code word.....	Sefta	Sefub	Segak	Sogba
Maximum horse-power required.....H. P.	7½	2½	2½	1½
Will cut in thickness, inclusive.....inches	¼	No. 8	No. 10	No. 18
Will circle from square blank.....inches	14-60	8-53	8-60	4:48
Throat of cutting head to frame.....inches	25	16½	36½	13
Throat of cutting head to gauge.....inches	23	16	34½	12½
Throat of circle arm.....inches	42	38	42½	36
T. & L. pulleys, diam. and face.....inches	28x6	20x4	20x4	12x2½
Speed of pulleys.....R. P. M.	150	170	230	230
Ratio of gearings.....	7:1	4½:1	6:1	4:1
Flanging Capacity				
Diam. of flanged discs not less than.inches	18	14	14	9½
Will flange in thickness, inclusive..inches	¼	No. 10	No. 12	No. 18
1/16 to ¼ in., 3-12 ft. dia., height up to....in.	2¼	.....	.....	.....
1/16 to ¼ in., 18-36 in. dia., height up to..in.	1¾	.....	.....	.....
No. 10.....inches	1½	1½	.....	.....
No. 12.....inches	1½	1½	1	.....
No. 14 and 16.....inches	1¼	1¼	1	.....
No. 18.....inches	.....	1	1	1
No. 20 and 22.....inches	.....	¾	¾	¾
No. 24 and 26.....inches	.....	½	½	½

NIAGARA CIRCLE SHEARS WITH FLANGING ATTACHMENT



No. 208A



No. 407A

NIAGARA FOOT SQUARING SHEARS

General Description

These machines should be used in all progressive sheet metal shops where power squaring shears cannot be installed, being intended for cutting the sheets to the required dimensions accurately and to good advantage.

Niagara Shears embody all improvements that have been found of real value in machines of this character. Only the best materials, properly distributed, are used in their construction. The wearing surfaces are large and adjustments are provided to take up wear. All parts are carefully fitted.

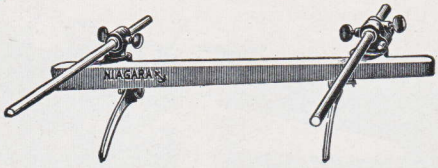
Length of Cut. The actual cutting length is about 1 inch more than the nominal size. The housings are far enough apart that sheets in width equal to the cutting length can be passed through from front to back without obstruction.

Bed, to which the lower knife is attached, can be shifted on its seats in adjusting the knives, and it is then bolted to the housings.

Holddown is applied to all shears 36 inches and longer and to those made for the heavier gauges. It holds the sheet while being cut and has one or more openings to enable the operator to see the cutting line.

Knives are made of high-grade steel welded to iron, the steel being properly hardened. The knives are ground true and fit without lining. They can be easily removed for grinding, and provision is made for taking up wear. For cutting cloth, cardboard, fiber, etc., the upper knife can be made with a long bevel, at extra charge.

Gauges. We furnish a set of front, back, bevel and side gauges. The back gauge, which is carried on brackets fastened to the cutter bar, can be set close up to the lower knife, that narrow strips can be gauged. The table and brackets for the front gauge have T slots. A graduated scale divided in sixteenths inch is marked on the bed.

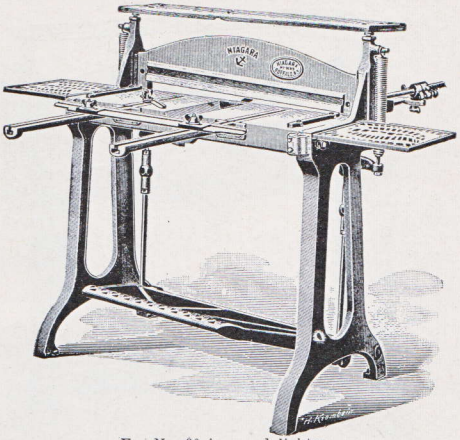


Back Gauge is mounted on micrometer gauge holders, which permits making close adjustment. The gauge can be quickly moved approximately to the required position and the final adjustment is then made by means of the micrometer device. The curved guides on back gauge are applied only to light pattern foot shears 36 inches and shorter.

Capacities given by us apply to iron or soft sheet steel. In cutting steel running higher in carbon, the hardness of the stock must be taken into consideration and the extreme thickness reduced accordingly. Do not use Shears for stock exceeding the extreme thickness given by us, even if the pieces to be cut are narrow. In making selection it is well to figure on ample leeway, as the capacity of Squaring Shears is influenced by the sharpness of the knives and by the care with which the adjustments are kept up by the operator.

Shipping. Our Squaring Shears are usually shipped set up ready for use. When it is desired, in shipping to distant points, to have the machines knocked down and boxed, there will be the proper extra charge.

EXCELSIOR FOOT SQUARING SHEARS



For No. 20 iron and lighter

This is an accurate and durable machine, well adapted to the ordinary work of tinsmiths, etc. It works easily from the beginning to the end of the stroke.

General Description (see page 96).

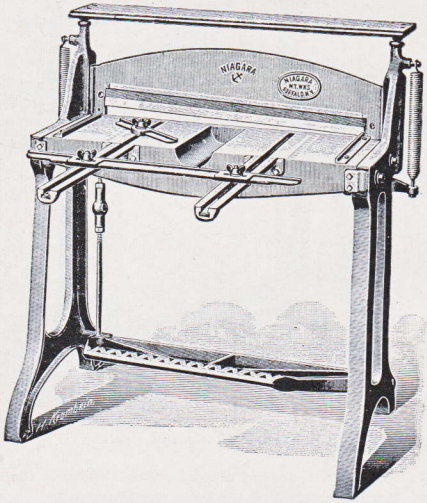
The illustration shows 30-inch Excelsior Squaring Shears with iron drop leaf tables and top shelf, which are furnished only if wanted, at extra charge.

	Code Word	Shipping Wt.	Price
30-inch Excelsior Squaring Shears.....	Tobda	435 lbs.	$.....

POWER SQUARING SHEARS

We make a large variety of Power Squaring Shears, from 2½ to 16 feet long and of various capacities, some with solid housings, others with gap. Catalog of Power Shears will be cheerfully mailed to those in need of such machines. Inquiries should state the desired cutting length, kind and thickness of heaviest material to be cut, etc.

QUEEN CITY FOOT SQUARING SHEARS



For No. 18 iron and lighter

These Shears are in appearance similar to the "Excelsior," but, being heavier and more powerful, they will cut thicker material

Holddown is included in prices of 36-inch and longer Shears.

Top Shelf is charged for extra, if wanted.

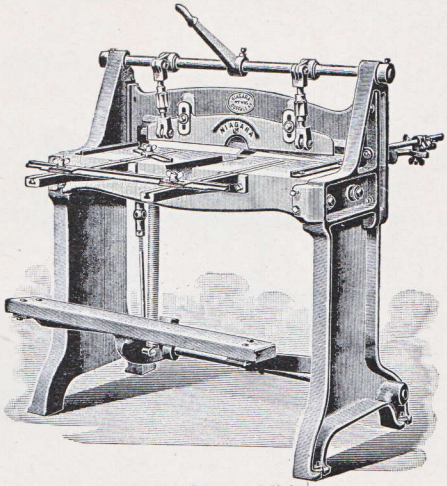
Steel Treadle is applied to 52 and 62-inch Queen City Shears.

General Description (see page 96).

Queen City Squaring Shears	Code Word	Shipping Wt.	Price
22 inch	Tobhm	365 lbs	$.....
30 inch	Tobew	500 lbs.	.....
36 inch	Tobix	645 lbs.	.....
42 inch	Toboi	780 lbs.	.....
52 inch	Tobro	1,000 lbs.	.....
62 inch	Tobup	1,300 lbs.	.....

Holddown to 30-inch shears is charged for extra if wanted.

HERCULES FOOT SQUARING SHEARS



For No. 16 iron and lighter

These are substantial and powerful machines. The treadle bars are made of steel and extensible to permit regulating the leverage according to the thickness of material to be cut.

For material heavier than No. 16 gauge, it is to the interest of users to install Power Shears, as such stock cannot be cut to advantage with foot-operated Shears.

Holddown is operated by hand lever. These Shears will not be furnished without this attachment.

General Description (see page 96).

Hercules Squaring Shears	Code Word	Shipping Wt.	Price
36 inch.....	Tocax	835 lbs.	$.....
42 inch.....	Toccy	925 lbs.	.....
52 inch.....	Tocim	1,275 lbs.	.....

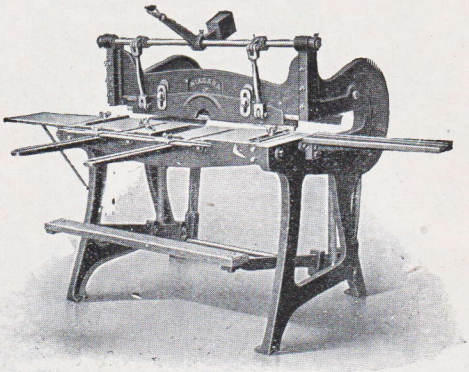
HERCULES SHEARS WITH CORRUGATED KNIVES

We can furnish our Hercules Shears with knives suitable for cutting across corrugated sheets. The special knives are shaped to conform with the corrugations.

Hercules Shears equipped with corrugated knives for 2½-inch corrugations will cut No. 18 iron and lighter. If the corrugations are smaller, the thickness of stock must be further reduced.

Power Squaring Shears can be equipped in a similar manner.

NIAGARA FOOT GAP SHEARS



For No. 16 iron and lighter

These Shears work well and can be relied on for good results. A series of compound levers which pivot on the housings connect the cross-head to the treadle rods.

Housings have a gap 18 inches deep to permit cutting apart sheets of any length as far from the edge as the gap allows it. The sheets can be moved in cutting position sideways without obstruction.

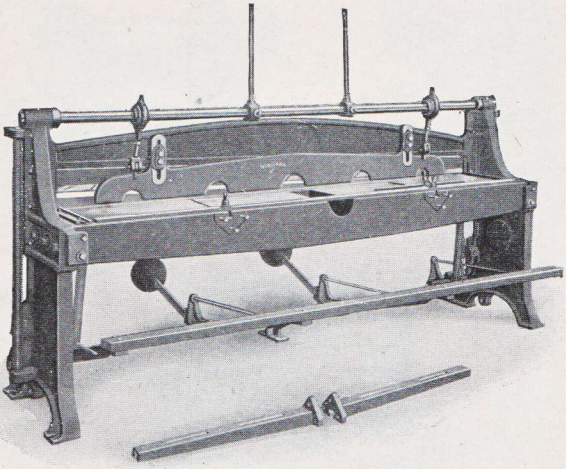
Treadle Bars are of steel and extensible, to permit regulating the leverage according to the thickness of material to be cut.

Slitting Gauge attached to the right-hand housing facilitates slitting sheets longer than the knives. After the first cut, the edge obtained is used for gauging to secure alignment of the successive cuts.

General Description (see page 96).

Niagara Foot Gap Shears	Code Word	Shipping Wt.	Price
36 inch 42 inch 52 inch } 18-inch throat, with holddown and gauges.....	Tocju Tocla Tocos	1,250 lbs. 1,350 lbs. 1,625 lbs.	$..... ....

NIAGARA FOOT SQUARING SHEARS, No. 172-F, ETC.



No. 196F
Capacity No. 13 iron and lighter

These are substantial and powerful machines, well fitted to insure durability and accuracy.

Holddown of No. 196-F is operated by hand lever, as shown in the illustration. No. 172-F has a spring holddown.

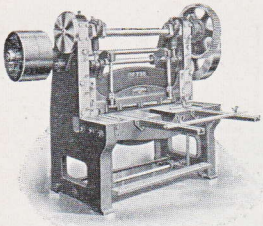
Improved Automatic Back Gauge can be substituted for the regular back gauge. It enables the operator to make adjustment for strips of varying widths, while maintaining the alignment of the gauge with the knives, both ends being moved at the same time.

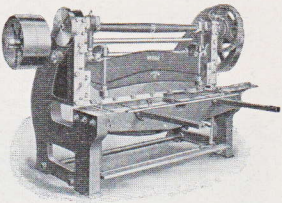
General Description (see page 96).

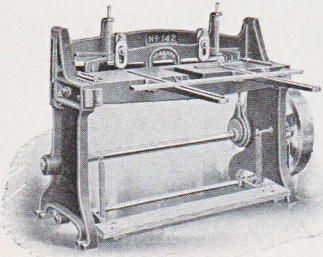
Niagara Foot Squaring Shears	Length	Code Word	Shipping Weight	Price
No. 172-F.....	72 inches	Tocst	1,750 lbs.	$.....
No. 196-F.....	96 inches	Tocuz	3,350 lbs.	.....

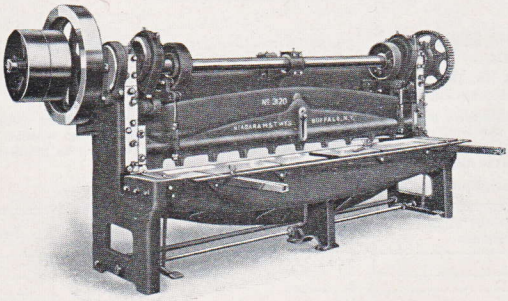
Improved Automatic Back Gauge, in place of ordinary one, extra. $.....

POWER SQUARING SHEARS—TYPICAL ILLUSTRATIONS



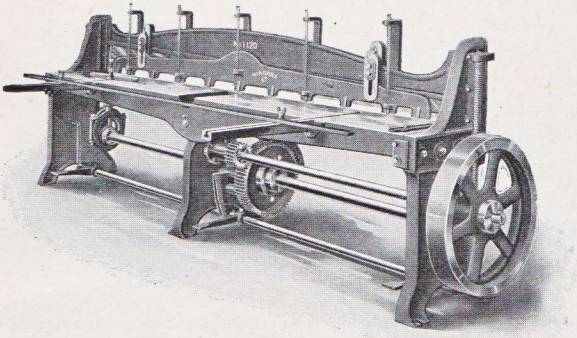


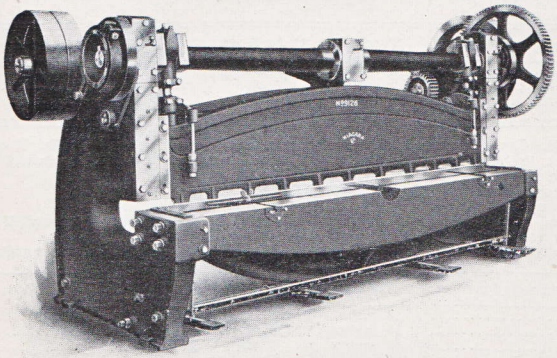




Niagara Power Squaring Shears are described in separate catalogue

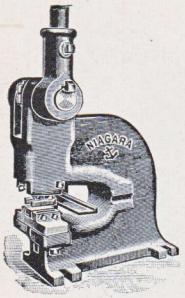
POWER SQUARING SHEARS—TYPICAL ILLUSTRATIONS



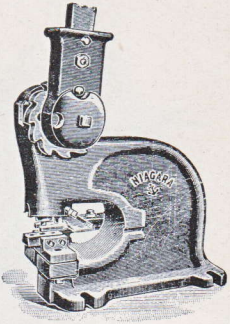


Made from 3 to 16 feet long, for soft steel up to ⅜ thick

NIAGARA LEVER PUNCHES



No. 12



No. 22

Intended for punching small round holes. Adjustable back gauge regulates the distance from the holes to the edge of the sheet and a stripper removes the stock from the punch at the upstroke.

Nos 12-16. The lever works both ways, front or back. For ¼ inch hole, through ¼ inch iron or equivalent.

$\frac{3}{32}$ and $\frac{5}{32}$ inch holes can be punched in angle iron with flange downward, if the center of the hole is not less than ½ inch from the inner corner.

Price includes punches for holes $\frac{3}{32}$, $\frac{5}{32}$ and $\frac{8}{32}$ inch diameter and one die to match.

Niagara Lever Punches	Throat	Code Word	Shipping Weight	Price
No. 12	6 inches	Tocxi	125 lbs.	$.....
No. 13	10 inches	Toczo	140 lbs.	.....
No. 14	15 inches	Todav	210 lbs.	.....
No. 16	25 inches	Todet	410 lbs.	.....

Nos. 22-28. Can be operated with or without ratchet, according to the work. If used direct, the lever works both ways, and with the ratchet towards the back of the machine.

Without ratchet, ½ inch hole through ¼ inch iron.

With ratchet, ½ inch hole through ⅜ inch iron, or equivalent.

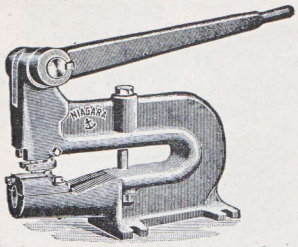
$\frac{3}{32}$ and $\frac{13}{32}$ inch holes can be punched in angle iron with flange downward, if the center of the hole is not less than ½ inch from the inner corner.

Price includes punches for holes $\frac{3}{32}$, $\frac{13}{32}$ and $\frac{17}{32}$ inch diameter and one die to match.

Niagara Lever Punches	Throat	Code Word	Shipping Weight	Price
No. 22	6 inches	Todfi	280 lbs.	$.....
No. 23	10 inches	Todho	405 lbs.	.....
No. 24	15 inches	Todig	615 lbs.	.....
No. 26	25 inches	Todme	980 lbs.	.....
No. 28	36 inches	Todob	1,750 lbs.	.....

In ordering extra punches and dies, specify the numbers marked at the holes of the die, or give sizes of holes to be punched.

NO. 44 NIAGARA LEVER PUNCH

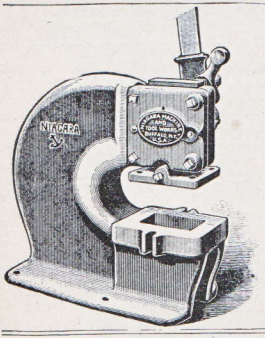


The round end of the base, in which the die is inserted, permits punching holes in pipe 4¼ inches diameter and larger and up to 7 inches from the end. To stiffen the frame a stay bolt can be used.

Capacity—Without stay bolt, No. 12 iron; with stay bolt, No. 9 iron.

Price includes punches and dies for holes $\frac{3}{32}$, $\frac{7}{32}$ and $\frac{3}{32}$ inch diameter.

	Throat	Code Word	Shipping Weight	Price
No. 44 Niagara Lever Punch.....	15 inches	Todsu	160 lbs.	$.....



NIAGARA LEVER PRESS

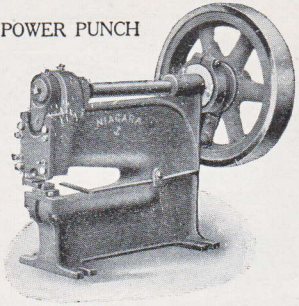
The slide has rectangular guides to insure true motion up and down, as required in punching square and irregular shaped holes. For light work the machine can be operated direct; for heavier work the ratchet is used.

Capacity—Without ratchet, ½-inch hole through ¼-inch iron; with ratchet, ½-inch hole through ⅜-inch iron or equivalent.

Niagara Lever Press	No.	2
Distance from center of slide to back	inches	6
Opening in bed	inches	5x5
Hole in slide—diameter and depth	inches	1x2
Distance from bed to slide when up	inches	4¼
Stroke of slide	inches	¾
Shipping weight	lbs.	455
Code word		Todux
Price	$	.....

Working parts are charged for extra, according to the size and shape of work, which should be fully explained.

NIAGARA POWER PUNCH



Principally intended for punching small round holes, but can also be arranged for small square and irregular holes. Adjustable Back Gauge regulates the distance from the holes to the edge of the sheets and a stripper is applied.

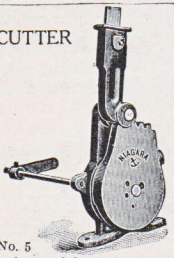
Clutch. The motion is controlled by a positive clutch actuated by foot treadle. It causes the slide to stop at the highest point after every stroke, unless the treadle is kept depressed.

Capacity. ¼-inch hole through ¼-inch iron, or equivalent; $\frac{7}{32}$ and $\frac{9}{32}$-inch holes can be punched in angle iron with flange downward, if the center of holes is not less than ½ inch from the inner corner of the angle.

Price includes punches for holes $\frac{5}{32}$, $\frac{7}{32}$ and $\frac{9}{32}$ inch diameter and die to match.

Power Punch	No. 124-A
Depth of throat.....inches	15
Distance from bed to bottom of slide, when up.....inches	2⅝
Stroke of slide.....inches	½
Hole in slide, diameter and depth.....inches	⅝x1
Size of flywheel.....inches	24x4
Speed of flywheel.....R. P. M.	125
Shipping weight.....lbs.	840
Code word.....	Toeca
Price .....$.....	

WIRE AND ROD CUTTER

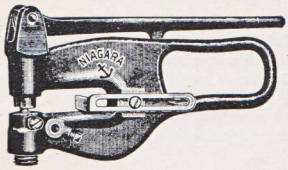


No. 5

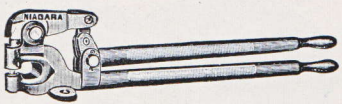
Intended for cutting round wire and bars of iron. Adjustable gauge is provided.

Wire and Rod Cutters	Code Word	Shipping Wt.	Price
No. 0. ⅛, $\frac{3}{16}$, ¼ inch diam.....	Toetc	5 lbs	$.....
No. 3. ¼, ⅜, ½ inch diam.....	Toemf	55 lbs.	.....
No. 5. ½, ⅝, ¾ inch diam.....	Toeol	110 lbs.	.....
No. 8. ½, ⅝, ¾, ⅞, 1, 1⅛ inch diam..	Toepo	350 lbs.	.....

PORTABLE LEVER PUNCHES—STEEL FRAME



No. 1A



No. 2C

These are handy tools. Made entirely of steel to combine strength with lightness.

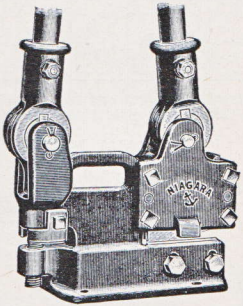
Capacity: No. 1-A—¼ inch hole through No. 18 iron, or equivalent.

No. 2-C—¼ inch hole through ⅛ inch iron, or equivalent. Will punch angle iron with flange downward, if the distance from center of hole to the inner corner of the angle is not less than ½ inch.

Price includes punches and dies for holes ⅛, $\frac{3}{16}$ and ¼ inch diameter.

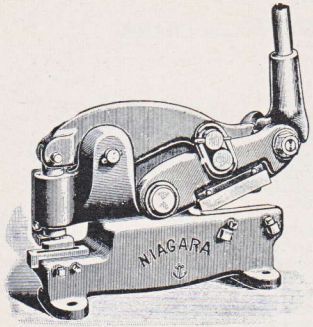
Portable Lever Punches	Throat Inches	Code Word	Net Weight	Price
No. 1-A	3	Toety	6 lbs.	$.....
No. 2-C	1¾	Toeve	15 lbs.	.....

No. 31 PUNCH AND SHEARS—STEEL FRAME



Made entirely of steel, to combine great strength with lightness. The frame is offset to permit cutting apart sheets of any length and width. Will punch ½ inch from inner corner of angle iron.

Punch and Shears	No.	31
Will cut iron in thickness up to	inches	⅛
Length of knives	inches	3
Will punch	inches	¼ thr. ⅛
Throat of punch	inches	1½
Dies and punches for holes in diameter	inches	¼, $\frac{3}{16}$, ⅛
Shipping weight	lbs.	40
Code word		Toers
Price	$	



No 2

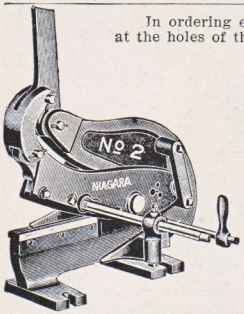
COMBINED SHEARS AND PUNCHES

Suitable for cutting apart sheets of any length and for punching round holes of small diameter. The extreme capacity can be obtained only in cutting off strips, not in splitting sheets, on account of the force used in bending the stock.

Nos. 2 and 3. The lever works towards the operator when he stands on either end in shearing as well as punching.

No. 224 has separate levers for the punch and shear parts.

Combined Shears and Punches No.	2	3	224
Will cut iron in thickness...inches	1/8	1/16	2/8
Length of knives...inches	5	8½	5
Will punch (or equivalent)...inch	¼ thr. 3/8	¼ thr. ¼	½ thr. 3/8
Throat of punch part...inches	3½	5	6
Die and punches for holes...inch	5/32, 7/32, 9/32, 11/32, 13/32	5/32, 7/32, 9/32, 11/32	13/32, 17/32
Shipping weight...lbs.	155	315	660
Code word...	Toeyn	Tofal	Tofby
Price ...$	.....	.....	.....



In ordering extra punches and dies, specify the numbers marked at the holes of the dies, or give sizes of holes to be punched.

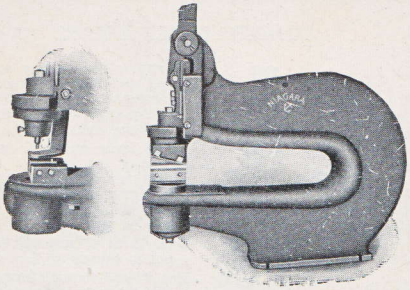
NIAGARA PLATE AND ROD SHEARS

Operated by powerful toggle mechanism and adapted to cutting apart sheets of any length and width, as well as bars. The extreme capacity can be obtained only in cutting off strips, not in splitting sheets, on account of the force used in bending the stock.

Adjustable gauges for cutting sheets and rods are applied. A holddown prevents the sheet from rising while being cut. The inserted dies for cutting rods are of tool steel and hardened.

Plate and Rod Shears No.	2	3
Length of knives...inches	10	10
Will cut plate iron up to...inches	3/16	¼
Will cut flat iron up to...inches	1/16x3	3/8x3
Will cut round iron up to...inches	5/8	¾
Shipping weight...lbs.	250	400
Code word...	Tofde	Tofeh
Price ...$	.....	.....

NIAGARA DEEP THROAT SHEARS AND PUNCHES



The deep throat of the frame permits cutting or punching holes in large sheets.

Knives are 4 inches long and have two cutting edges, which can be used alternately. They are arranged to swivel, to permit cutting from back to front, right to left, or at any desired angle. The position of the knives can be changed quickly.

Punching Attachment can be applied to the Shearing Machines, that shearing or punching can be done alternately. It consists of punch and die holders, stripper, punches and die for holes $\frac{5}{32}$, $\frac{7}{32}$ and $\frac{9}{32}$ inch diameter.

Nos. 55 to 58 will cut ⅛-inch iron and lighter. Will punch ¼-inch hole through ⅛-inch iron, or equivalent.

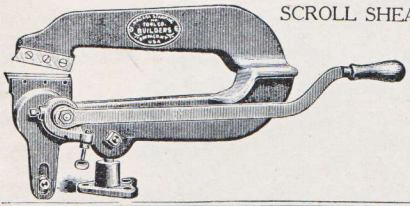
No. 66 will cut $\frac{7}{32}$-inch iron and lighter. Will punch ¼-inch hole through ¼-inch iron, or equivalent.

Deep Throat Shears	Throat	Code Word	Shipping Weight	Price
No. 55	18 inches	Tofhr	350 lbs.	$.....
No. 56	24 inches	Tofka	460 lbs.	.....
No. 58	36 inches	Tofam	810 lbs.	.....
No. 66	24 inches	Toftz	500 lbs.	.....

Punching attachment extra.

Deep Throat Punches	Throat	Code Word	Shipping Weight	Price
No. 55	18 inches	Tofub	350 lbs.	$.....
No. 56	24 inches	Tofwi	460 lbs.	.....
No. 58	36 inches	Tofyo	810 lbs.	.....
No. 66	24 inches	Togak	500 lbs.	.....

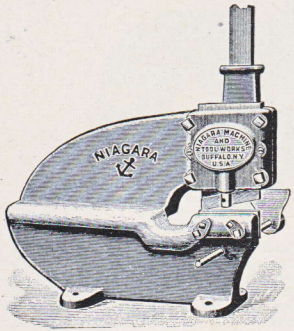
SCROLL SHEARS



For No. 20 iron and lighter. Will cut ovals, ogees and irregular shapes. Length of knives, 4½ inches. No. 2 has the knives at right angles to the frame.

Scroll Shears	Throat	Code Word	Ship. Wgt.	Price
No. 1	11½ inches	Togep	90 lbs.	$.....
No. 2	11½ inches	Toggo	75 lbs.	.....

NIAGARA LEVER SHEARS



No. 13

Suitable for cutting apart sheets of any length and width. The extreme capacity can be obtained only in cutting off strips, not in splitting sheet on account of the force used in bending the stock.

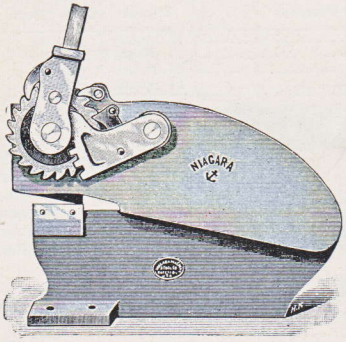
The lever works towards the front and one man can operate the machine. The knives are adjustable for wear. The hold-down attachment prevents the material from rising while being cut and an adjustable gauge is provided.

Nos. 13 to 15 are operated direct for iron not to exceed ¼ inch thick.

Nos. 14 and 15 must be used with ratchet for iron ¼ to ⅜ inch thick.

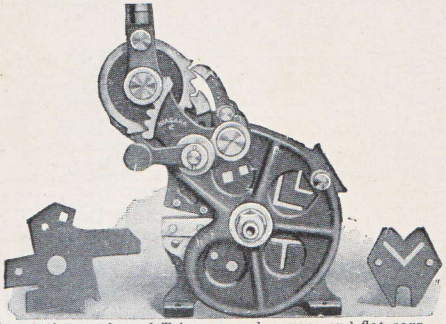
No. 15 must be operated with compound lever for iron from ⅜ to ½ inch thick. The frame of this machine carries a spring device that crowds between the two parts of the sheet and holds them apart at the upstroke, to facilitate moving the sheet forward for each cut.

Niagara Lever Shears	Will Cut Iron	Length of Knives	Code Word	Shipping Weight	Price
No. 13.....	¼ inch	4½ inches	Togle	300 lbs.	$.....
No. 14.....	⅜ inch	5 inches	Togru	490 lbs.	.....
No. 15.....	½ inch	6 inches	Togta	900 lbs.	.....



No. 15

UNIVERSAL SHEARS FOR PROFILES AND BARS



Intended for cutting angle and T iron, round, square and flat bars.

The frame consists of two parts, made of steel castings, with inserted tool steel dies. One of the two parts is stationary, while the other can be given a limited rotary motion around the center pivot.

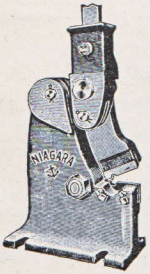
The angle iron cutters are removable to permit substituting others for angles of smaller sizes, or for different shapes; the cutters for T iron, also for round and square bars, are fixed.

The machine has a compound mechanism used for heavier work, or it can be operated direct, with greater speed, in cutting lighter stock. Holddown plates on the side of the machine hold and guide the stock while being cut off.

Dies are furnished for—

Angle iron—2½x3⅜ inches.
Angle iron—2 x¼ inches.
T iron—2½x3⅜ inches.
Round bars—¾ and 1 inch.
Square bars—¾ and 1 inch.
Straight knives—4½x⅝ inches flat.

	Code Word	Shipping Wt.	Price
Universal Shears for Profiles and Bars.	Togud	370 lbs.	$.....



BAR SHEARS NO. 4

This machine has a powerful toggle movement. It is usually furnished with straight knives, but knives for cutting angle iron 1½x1½x¼ inch can be substituted.

Bar Shears No.	4
Will cut round iron in diameter up to...inches	¾
Will cut flat iron up to.....inches	$\frac{5}{16}$x2
Length of knives.....inches	3¾
Shipping weight.....lbs.	180
Code word.....	Tohba
No. 4 Bar Shear with straight knives.....$	.....
Code word.....	Tohmi
With knives for angle iron.....$	.....

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